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TRANSACTIONS

OF THE

Fifteenth International Congress on Hygiene and Demography

WASHINGTON
September 23-28, 1912

PUBLISHED BY THE COMMITTEE ON ORGANIZATION

EDITED BY THE SECRETARY GENERAL

VOLUME III

PART I.—PROCEEDINGS OF SECTION III

Hygiene of Infancy and Childhood: School Hygiene

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SECTION III.

HYGIENE OF INFANCY AND CHILDHOOD: SCHOOL HYGIENE.

REPORT OF THE SECRETARY.

Dr. Abraham Jacobi, *President Section III*,
Fifteenth International Congress on Hygiene and Demography.

Sir: In accordance with the provision of Article XII of the regulations of the congress, I herewith submit a report of the section proceedings of the meeting held at Washington, September 23 to 28, 1912, together with such manuscripts of the papers read as have been delivered into my hands.

Monday, September 23—1.30 p. m.

The first session was called to order by the president, Dr. Abraham Jacobi, who announced the following honorary presidents of Section III:

Prof. Dr. Adolf Baginsky, Berlin, Germany; Dr. Manuel Uribe y Troncoso, Mexico City, Mexico; Dr. Mosny, of the Academy of Medicine, Paris, France; Dr. Gustav Alexander, professor, Vienna, Austria; Dr. Leotardo Mátus Z, professor, Santiago, Chile.

After the announcement of the honorary presidents, the following remarks were made by the president of the section:

I prefer not to detain you with the discussion of any questions concerning babies or schooling. A baby is a small thing but has occupied many minds; yours in particular. The same I say about schools and schooling. I do not pretend to teach you anything new or old. On the contrary, you have come here to teach me and the rest of the people. So indeed I shall be glad to listen. I can not help considering this section of yours the most important of all. Saving children and instructing and educating them means the future of the republic and of mankind. It is on the foundation of pediatrics, as we understand it, that the gravest problems of sociology must be solved.

The president of this section begs to thank you for your presence in spite of some difficulties. When the program was completed and the Monday and Tuesday meetings were amply provided for, there came the invitation to the President's reception. It was meant as a kindness and as his appreciation of the aims and meaning of this great congress, but nevertheless it has interfered somewhat with the plans laid out for our meetings. Their results will in a great measure depend on your cooperation. The papers to be presented to you are many, and a great number of them valuable additions to your knowledge. I hope their authors will limit their public remarks to the presentation of what is novel or affords new viewpoints. It is understood that the reading of a paper should never occupy more than 20 minutes, not even so many as 20. The gist of a paper may usually be condensed so as to allow of time for discussion. You will share my opinion, fortified by much experience, that discussions furnish in many a case more results than a drawn-out lecture. But, as a rule, no individual discussion of a paper just read should occupy more than 5 minutes. The reading of a paper should generally be finished in 10 minutes. It will be printed in full, and no part of it will be lost to the student.

Now, there can be no doubt that it is the business of the presiding officer to be found fault with. While submitting to this law of congressional nature, he must and will keep order. Appeals to the meeting, however, he will obey. So let us go to work. Please remember that those in the audience have more rights than those on the platform; the latter have more duties.

Unless the speakers be heard they might rather not begin. Talking into one's own manuscript only is not complimentary to the listener. The reader's name will be announced from the chairman's place. Whoever applies for the floor to participate in a discussion will be good enough to pronounce his or her name loudly and proudly.

One more word. You may not approve of the place assigned to each paper on the program. Speaking for myself, or against myself, I admit that the program committee has not always succeeded in finding the proper position for every contribution. Mistakes must occur when the papers are coming in at irregular times and sometimes very late. But the chairman is now bound by the program. He will try to keep order, and asks for sympathy and patience when everything is not running smoothly. There is one point on which we shall have to insist—that is, the presence of a writer when his paper is called out. If he be absent, it will not always be possible, though both the chairman and the audience be willing, to accommodate him (though he be a she or addicted to any color, religion, sex, or other previous servitude). And now I am at your service; please deal gently with me.

Papers were presented in the symposium on the hygiene of infancy and childhood, as follows:

Instruction in Child Hygiene, by Dr. Mary Sutton Macy, School of Pedagogy, New York University, New York City.

A Plan for Teaching School Hygiene, by Dr. Ira S. Wile, New York City.

Open-air Schools and Open-air Instructions, with Breathing Exercises in Schools and Colleges to Prevent Tuberculosis and Other Diseases (with demonstration of exercises), by Dr. S. Adolphus Knopf, professor of medicine, department of phthisiotherapy at the New York Post-Graduate Medical School and Hospital, New York City.

Fundamentals of the Hygiene of the Teacher, by Dr. Grace N. Kimball, Poughkeepsie, N. Y.

Disinfection of the Posterior Nares, a Preventive against Infection, by Dr. John J. Cronin, department of health, New York City. (Read by title.)

The Occurrence of Syphilis and Gonorrhea in Children by Direct Infection, by Dr. Abraham L. Wolbarst, New York City.

Sex Instruction and Hygiene of Boyhood, by Dr. Elias G. Brown, director of the Mountain School, Allaben, N. Y.

The following members of the congress joined in the discussion: Dr. Frank Warner (Columbus, Ohio), Dr. Leo Burgerstein (Vienna, Austria), Dr. C. Ward Crampton (New York City), Dr. Maximillian P. E. Groszman (Plainfield, N. J.).

TUESDAY, SEPTEMBER 24—9.30 A. M.

The second session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the morning.

Papers were presented on the subject of the hygiene of infancy and childhood, as follows:

Hygiene of City Babies, by Prof. Dr. Adolf Baginsky, Königl. Friedrich Wilhelms Universität, Berlin, Germany. (Abstract read by Dr. A. Jacobi.)

St. Margaret's House, Albany, an Institution for the Care of Babies and the Training of Nursery Maids, by Dr. Henry Larned Keith Shaw, Union University, Albany, N. Y.

The Foundling, by Mr. Homer Folks, New York City.

A Discussion of the Baby-Saving Show held in Philadelphia in 1912, by Dr. Samuel McC. Hamill, professor of pediatrics, Philadelphia Polyclinic, Philadelphia, Pa.

The Method of Construction Required at the Present Time by the Hygiene of the Modern Schools, and their Influence on the Health of Childhood, by M. Augustin Rey, architect, Paris, France. (Read by Mr. Adolphe Smith.)

The Effect of Humidity, Temperature, Air Movement, and Barometric Pressure on the Blood Pressure, Pulse, and Respiration of Children under the Influence of Various Forms of Ventilation, by B. Raymond Hoobler, A. M., M. D., New York City.

School Disinfection, by J. T. Ainslie Walker, F. R. S. M., F. C. S., New York City.

The following members of the congress joined in the discussion: Dr. Hastings H. Hart (New York City), Dr. Henry L. K. Shaw (Albany), Dr. L. T. Royster (Norfolk), Dr. P. M. Hall (Minneapolis), Dr. T. M. Koon (Grand Rapids), Dr. D. M. Totman (Syracuse), Dr. William Estabrook Chancellor (Norwalk), Dr. Thomas F. Harrington (Boston), Dr. J. N. Hurty (Indianapolis), Dr. Boyd W. Knight (New York City), Mr. H. O. Way (Cleveland), J. T. Ainslie Walker (New York City).

TUESDAY, SEPTEMBER 24—2 P. M.

The third session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the afternoon.

The following papers were read:

The Reduction of Infant Mortality in New York City, by Dr. S. Josephine Baker, director bureau of child hygiene, department of health, New York City.

The Campaign against Infectious Diseases of Children, by Dr. Walther Ewald, Akademie für Sozial- und Handelswissenschaften, Frankfurt a M., Germany. (Read by title.)

The School Children of the Stockyards District, by Dr. Caroline Hedger, Chicago, Ill.

Management of Tuberculosis among School Children, by Dr. Arthur T. Cabot, Boston, Mass. (Read by title.)

Diseases Contracted during School Life, by Prof. Dr. Adolf Baginsky, Berlin, Germany. (Read by title.)

Mental Hygiene in the School, by Dr. William H. Burnham, professor of pedagogics, Clark University, Worcester, Mass.

Studies in the Relation of Physical Inability and Mental Deficiency to the Body Social, by Dr. Isabelle Thompson Smart, department of education, New York City.

The Significance of Physiological Age in Education, by Dr. C. Ward Crampton, director of physical training, department of education, New York City.

The following members of the congress joined in the discussion:

Miss Minnie H. Ahrens (Chicago), Dr. F. Duffield (Detroit), Dr. Thomas F. Harrington (Boston), G. J. Holmes (Newark), Dr. L. T. Royster (Norfolk), Dr. Ira S. Wile (New York City), Dr. Maximilian P. E. Groszmann (Plainfield).

WEDNESDAY, SEPTEMBER 25—9.15 A. M.

The fourth session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the morning.

Papers were presented on the subject of school inspection, as follows:

The Relation of Teacher and Pupil, with Especial Reference to the Education of Immigrants in American Public Schools, by Dr. William E. Chancellor, superintendent of schools, Norwalk, Conn.

Results to the Individual from Medical Inspection, by Dr. Leo Burgerstein, K. K. Regierungsrat, Vienna, Austria.

Efficiency of Medical Inspection, by Dr. Willard S. Small, principal, Eastern High School, Washington, D. C.

What Medical Inspection of Schools Can Do for the Teacher, by Dr. Helen MacMurchy, Toronto, Canada.

A Follow-Up System in Medical Inspection, by Dr. Thomas A. Storey, College of the City of New York, New York City.

The following members of the congress joined in the discussion: Dr. Maximillian P. E. Groszmann (Plainfield), Dr. William Estabrook Chancellor (Norwalk), George J. Holmes (Newark).

THURSDAY, SEPTEMBER 26—9.15 A. M.

The fifth session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the morning.

The following papers were read:

The Activity of the Woman Physician in Women's Colleges, by Fräulein Dr. H. Stelzner, Charlottenburg, Germany. (Abstract read in English by Dr. Ethel Blume.)

The Public School as a Possible Factor in Preventing Infant and Child Mortality, by Dr. Henry L. Coit, Newark, N. J.

The Need of Community Planning in Child-Welfare Work, by Mr. Wilbur C. Phillips, Milwaukee, Wis.

Parents' Cooperation in Promotion of Child Hygiene, by Mrs. Frederic Schoff, president National Congress of Mothers, Philadelphia, Pa.

Conservation of Child Life, by Dr. Charles Gilmore Kerley, New York City.

The Conservation of Infant Life in Certain American Cities, by Miss Ellen C. Babbitt, Russell Sage Foundation, department of child helping, New York City.

A Study of the Infant Mortality in Fall River, Mass., and its Relation to the Employment of Mothers, by Mr. Charles H. Verrill, Bureau of Labor, Department of Commerce and Labor, Washington, D. C.

THURSDAY, SEPTEMBER 26—2 P. M.

The sixth session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the afternoon.

Papers were presented as follows:

Field Work in Tuberculosis by Dr. Mary E. Lapham, Highlands Camp Sanatorium, Highlands, N. C.

The motion duly made, seconded, and carried, it was

Resolved, That the resolutions introduced by Dr. Thomas F. Harrington be received and forwarded to the president of the Permanent

International Commission, Dr. Max Rubner, with an expression of our appreciation:

> Whereas the keynote of the Fifteenth International Congress on Hygiene and Demography in promoting and in conserving health is education, cooperation, and organization; and
>
> Whereas these means may be effectively fostered by a united intensive concentration upon a definite plan of action elastic enough to meet the needs of all: Therefore,
>
> *Be it resolved*, That the Fifteenth International Congress on Hygiene and Demography designates the first Friday in October to be known as Health Day, to be observed annually by schools, municipalities, armies, and navies throughout the world as a means by which the prevention of preventable diseases and accidents may be learned and the cure of curable diseases intelligently appreciated, and further,
>
> *Be it resolved*, That in the observance of Health Day all available resources of the home and of the school, of the teaching and of the medical and dental professions, of the municipalities, of the state, and of social organizations be fostered and utilized in each locality.
>
> *Resolved*, That the permanent international commissioners of the Congresses of Hygiene and Demography be instructed to forward to national committees and to official delegates a copy of these resolutions as a part of the official report to governments, organizations, and insɑtitutions represented at the Fifteenth International Congress on Hygiene and Demography.

The Results of the German Central Committee in the Movement for Dental Work in the Schools of Germany, by Zahnarzt Dr. Konrad Cohn, Berlin, Germany. (Read in part by Dr. P. B. McCullough.)

Dental Hygiene for Pupils of Public Schools, by Dr. S. Adolphus Knopf, New York City.

The Human Mouth in its Relation to Public Health, by Dr. William G. Ebersole, chairman oral hygiene committee, National Dental Association, Cleveland, Ohio.

The Hygiene of Children's Teeth, by Dr. William H. Potter, professor of operative dentistry, Harvard University, Boston, Mass.

FRIDAY, SEPTEMBER 27—9.15 A. M.

The seventh session was called to order by the president, Dr. Abraham Jacobi, who presided throughout the morning.

Papers were presented as follows:

The Education of Muscles Suffering from Partial Paralysis, by Earl Barnes, Philadelphia, Pa.

Trained Midwives in their Relation to Infant Welfare, by Miss Clara D. Noyes, general superintendent, training schools, Bellevue and Allied Hospitals, New York City.

Organization of the Work of Infant Consultation and Health Visitors, by Dr. Janet Lane-Claypon, King's College for Women, University of London, England.

Municipal Supervision of Maternity, by Dr. S. W. Newmayer, in charge of division of child hygiene, bureau of health, Philadelphia, Pa.

Prophylactic and Therapeutic Value of Fresh Air in Schools and Hospitals, including Heliotherapy, by Dr. John W. Brannan, president, Bellevue and Allied Hospitals, New York City.

The Anthropological Study of Children, by Prof. Franz Boas, Columbia University, New York City. (Read by title.)

Physical Efficiency Tests, by Dr. James H. McCurdy, Young Men's Christian Association Training School, Springfield, Mass. (Read by title.)

The Esthesiometric Method, measuring Fatigue in the Light of the Logarithmic Method of Dr. Améline, by Dr. M. C. Schuyten, director of the Pedologic Laboratory, Antwerp, Belgium.

Mortalidad Infantil en la República del Uruguay en el Decenio 1901–1910, by Dr. Julio A. Bauzá, director del Consultorio Gota de Leche No. 1, Montevideo, Uruguay.

The following member of the congress joined in the discussion: Mrs. William Lowell Putnam (Boston).

I have the honor to report also the meeting, on Thursday afternoon, September 27, of the subsection on mental hygiene, Dr. L. F. Barker, chairman, Dr. G. L. Blumer, secretary.

The following papers were read:

The Prevention of Feeble-mindedness, by Dr. Henry H. Goddard.

The Scope of Work of the National Committee for Mental Hygiene, by Dr. L. F. Barker.

The Preventable Causes of Insanity, by Dr. Thos. W. Salmon.

Notes on the Prevention of Epilepsy, by Dr. L. Pierce Clark.

Limitations and Fallacies in the Education of the Feebleminded, by Dr. Woods Hutchinson.

Respectfully submitted.

Luther H. Gulick, M. D.,
Secretary of Section III.

MONDAY AFTERNOON, SEPTEMBER 23, 1912.

INSTRUCTION IN CHILD HYGIENE.

MARY SUTTON MACY, M. D., Secretary of the Public Health Education Committee of the Medical Society of the County of New York.

Child hygiene is a comparatively recent development or specialization of interest in a broader field of practical care of the health of the individual and the community. Infant hygiene has had a longer period of careful attention, chiefly because the infant is more apt to be retained under the immediate care of the physician than is true of the older child. Municipal hygiene, industrial hygiene, school hygiene, and other subdivisions of the kind have received considerable, in fact extensive, attention because of their direct and vital bearing upon community efficiency, which is another way of saying, because they directly touch the public pocketbook and are to be reckoned in dollars and cents.

The larger number of children have the fortunate or unfortunate habit of being obstinately healthy, even in unhygienic and unsanitary surroundings, if we exclude the occasional infections to which all children are liable, though not necessarily subject, such as diphtheria, scarlet fever, measles, and the like. Therefore less attention was naturally attracted to the subject of child hygiene until the schools began to notice the laggards, the defectives, and the delinquent children. Subsequent investigations and study produced a growing sentiment in favor of helping these unfortunate and non-normal children by paying attention to their personal hygiene at home and in school, and so child hygiene became an issue.

Even to-day, after several years of careful attention to the hygiene of childhood, the literature on the subject is meager, so far as I have been able to discover. By that I mean the literature which bears directly on the hygiene of the child—its physical hygiene, its mental hygiene, its moral hygiene, and its social hygiene—as influencing the individual at various periods of its growth.

We have a mass of undigested and more or less contradictory anthropometric data, very little of which is available to assist the parent and teacher in understanding the physiologic variations occasioned by growth, and most of which is therefore inadequate to serve them as a basis for practical hygiene.

We have libraries of so-called school hygiene, largely statistics and accounts of experimental investigations and mostly unapplied or lacking in such elucidation as would make them readily applicable to masses of natural children by anyone but a trained statistical specialist in hygiene who possessed the power to expend unlimited money, unhampered by boards of education, boards of health, or other collections of individuals not in perfect sympathy with the particular "fads" of the specialist.

We possess a constantly growing ocean of literature on "child study," which concerns itself chiefly with the distinctly pedagogical and psychical interests of the child and gives but desultory and uninterested attention to the hygiene of physiological growth or, for that matter, to the real hygiene of mental growth.

We possess, even in medical literature, but scant information on the physiologic adjustments made by the complex human mechanism to the alterations in function, position, mechanism, and use of organs and systems incident upon alterations in growth. Here is a field for the statistician, for the experimenter, and for the digester and assimilator of literature to work together for the enriching of the literature of child hygiene.

Having thus briefly and sketchily reviewed the available means of instruction in child hygiene in the field of literature, let us consider what other sources of information are open to the parent, the teacher, and the general public.

(1) Let us consider the instruction of the parents.

(*a*) As individuals concerned with the individual care of their own children the parents can and naturally do turn to the medical profession for instruction in child hygiene. But few parents, even among the rich, feel that they can afford to go to the physician and pay the required fee in order to be told the details of simple cleanliness, fresh air, exercise, rest, work, and relaxation, which would best benefit their perfectly healthy child. Consult the physician if the child is sick? Yes. Get a prescription for medication as well as the advice in simple hygiene; and you have another proposition in the parent's mind. On the other hand, few doctors, be they general practitioners or specialists, would feel that they had time to give such hygienic advice for well children in the consultation hours which they are accustomed to devote to the cure of suffering humanity. And the poor can not afford such consultation at any time.

(*b*) As collections of individuals, in social groups, in mother's clubs, or in parents' meetings connected with the schools and settlements, parents can be instructed in the details of normal child hygiene by means of occasional talks or lectures, or of courses of teaching, which shall include not only the telling but also the showing how to do definite, necessary, and simple things to maintain the health of the normal child. These talks should be given by the school doctors, or the school nurses, or both; to the mother's clubs, or parents' meetings of the school or settlement, and may well be supplemented, especially among the poor, by demonstrations in the selection and preparation of the child's food, exercise, and clothing, by the school-teachers of cooking, physical training, and domestic science; and they should also be supplemented by visits to the homes of the ignorant, to reenforce and reiterate necessary items of domestic hygiene. Among the better classes talks on child hygiene should form regular events of the meetings and lectures of the women's clubs, and might well form subjects for meetings at assemblies of men, such as lodge meetings and other gatherings, where fathers and prospective fathers may be instructed in that vital personal hygiene which concerns themselves as it pertains to their sons and to their daughters. All such talks or lectures should be given by physicians who are at once interesting speakers and authorities upon the subject they present, and should be supplemented by outlined reading.

(*c*) Colleges and universities which train the young men and young women of the country might well include the subject of child hygiene in the curriculum as a practical subdivision of domestic or even political economy, in such a form that it should serve to stimulate an appetite for more detailed knowledge by the individual before he or she assumes the rôle and duties of citizenship and parenthood.

(2) Let us consider the teacher's instruction in child hygiene. To be more accurate in the use of the present tense, I should have said let us consider the teacher's lack of instruction therein. In no other profession with which I am in the least familiar does the practitioner know theoretically so much about the tools for the work and so little about the material upon which the work is to be performed. Our normal colleges and training schools for teachers ground their students most carefully in method and in matter to be taught, including much theory in psychology, in didactics or induction, in *school* hygiene—note the emphasis on the qualifying adjective, please—in grammar and rhetoric, in discipline, in domestic science, and other sciences which the future teachers may or may not be able to put into practice, depending upon the character and amount of supervision they are subjected to, and the whims of the school boards which may govern their individuality, but, alas! it must be confessed the physiology taught to the teachers is a farce, the hygiene is theoretically good for the school and practically impossible with the child. It is strange how insistently perverse is the human nature of the normal healthy child, which refuses to conform, in any safe number of particulars, to the data offered as characteristic of the average child in the carefully taught rules of "child-study classes." Fortunately for the future of our country, the children do persist in refusing to be average. Why lay so much emphasis upon the biology

of invertebrates and lower vertebrates, details of which the high-school teacher must give to her classes, and absolutely refuse to teach the teacher any practical biology of man? The child is the material upon which the teacher's work must be done. It is only fair and just to child and to teacher that the child's nature should be known to and understood by the person who is expected to develop and train it. The mistake pedagogy has made, and continues to make, is to emphasize the psychic nature of the child, and ignore the physical—the fundamental—nature, which must be normal before the psychic can mature.

The courses in physiology and hygiene of childhood in the normal schools and training schools for teachers should be practical; not only didatic or inductive, but laboratory, methods being employed. They should be wide in scope and inclusive in range of years covered, and they should be compulsory on all teachers.

The physiology course should be practical, not only in the instruction of details of mature function in the digestive, the respiratory, the circulatory, the excretory, the muscular, the nervous, and the reproductive systems, but also in the variations of balance incident to and consequent upon variations in maturity. The differences observable at stated periods of growth, and the effects thereof upon the physical efficiency of the child, should all be made definite and repeatedly emphasized to the pedagogical student. This should be a major course in the curriculum and should be taught by a specialist, preferably a physician or an expert from a physiological laboratory, and not by a teacher from the ranks.

The course in hygiene of childhood should be parallel with the physiological course, and should aim to apply to the uses of the teachers, the physiologic truths, and data furnished by the major course. Practical opportunity to apply the knowledge gained should be liberally supplied. The student-teacher should be called upon to give evidence of efficiency, by suggestions in actual cases, for (1) the improvement of home hygiene in specific cases, (2) for the adaptation of the ordinary schoolroom facilities to the greatest good of the greatest number of individual children in a given class, and (3) by being required to make practical suggestions for the improvement of the existing school conditions, with a view to minimizing the non-hygienic obstacles in the paths of the children of the given class. This course also should be conducted by an expert.

(3) Let us consider the instruction of the general public in the hygiene of childhood.

It is to be accomplished in a variety of ways. First, by occasional free public lectures by well-known and competent authorities; second, by newspaper and magazine propaganda; third, by lecture courses, under the auspices of boards of education, boards of health, university extension, or local medical societies; and, fourth, by societies for the study of child hygiene, which give lecture courses, publish authoritative data in inexpensive and easily comprehensible form, and which in other ways attempt to mold public opinion.

The scope of public instruction should include such general topics as (1) the character, preparation, variety, and amount of foods for children of varying ages; (2) the ventilation of the home, the nursery, the sleeping room, and the school and playroom; (3) the value of exercise, its kind, amount, environment, restriction, and scope, according to the age periods of the child; (4) outdoor life, its educational as well as its hygienic value and significance; (5) sleep, and its amount, environment, bedding, clothing, and hours, according to varying age periods; (6) clothing, its nature, texture, character, variety, amount, and the dangers of inadequate, superabundant, and improper clothing; (7) work, character and amount of mental, manual, and physical work which is legitimate for various stages of physiological maturity, dangers to the child and the community from child labor; purposes of the varied curriculum and its so-called fads and frills; (8) sex hygiene, its relation to social morals, physical health, and community efficiency; its methods of instruction, time, place, and specific information to be given at differing ages; (9) play, its meaning, supervision, time, and character; and (10) personal hygiene and the prevention of contagious diseases.

Time forbids a more lengthy statement of the means, but we must glance for a few moments at the needs for instruction in child hygiene, and I would ask you to consider these under the following heads: (*a*) Individual needs of children, parents, and teachers, (*b*) school needs, (*c*) social needs.

A. The individual needs of such instruction for the children are that they may have (1) " fair play " and (2) an opportunity to react in a normal fashion to environments adjusted to develop the maximum of efficiency with a minimum of wear and tear on health and of waste of energy.

The individual needs of instruction in child hygiene for the parents are to enable them to fulfill their duty to their child by providing, in so far as is physically possible, an environment which will promote the development in their offspring of the desirable traits of biologic heredity, and afford opportunity for the healthy maturing of all physical and psychical functions in due order and due time.

The individual needs of instruction for the teachers are that they may be enabled to make use of their knowledge, not only to prevent wear and tear for themselves and their pupils, but also, by removing preventable obstacles, and promoting normal conditions, facilitate the development and growth which they desire, and direct its course along natural lines at normal times.

B. The school needs which call for instruction in child hygiene are manifold, and I shall suggest but a few of them: (1) The maintenance of a normal standard of efficiency in the physique, and therefore in the minds of the children; (2) the regulation of the curriculum to the capacities of the child, by avoiding overstimulation and consequent exhaustion through a crowded curriculum, and by avoiding understimulation and consequent inertia among the supernormal or highly gifted children, to whom the present curriculum might readily be adapted without being overcrowded, and by avoiding misdirected stimulation, prevent much truancy, delinquency, backwardness, and inefficiency; and (3) the institution and development of a practical eugenics, which shall assist in the elimination of mental deficiency and preventable physical deficiency, by a broad education in the value of physical and mental efficiency in community life.

C. The social needs, like the school needs for instruction in child hygiene, are legion, and we have time to name but a suggestive few; (1) the prevention of child labor; (2) the dangers to child life of congestion of population and therefore its relation to community welfare; (3) the value of the healthy child as a community asset, and its place in the social system; (4) the dangers to social efficiency in childhood as well as adult life, from debauchery, prostitution, and all forms of vice; and (5) the rights of the child—who has not asked to be born—and the social, moral, and physical obligations of its parents and the community in which it lives.

In closing, let me give a few items of interest which I have obtained as the result of a questionnaire sent out this last April concerning what has been done along the lines suggested in this paper in the city of New York within the last few years.

Inquiry brought out the facts that the following opportunities were freely used for the instruction of parents in child hygiene:

(1) In schools, vacation playgrounds, offices of philanthropic organizations, and in milk stations, lectures on the care of infants and on child hygiene are given by doctors and nurses regularly appointed in the Department of Health, under the Division of Child Hygiene organized in 1908. This division also provides literature in the form of pamphlets for free distribution.

(2) The Association for Improving the Condition of the Poor, under its committee on physical welfare of school children, gives lectures in public schools, though it is not specified if these are pertinent to child hygiene per se. In 1910 this committee also employed

dieticians to instruct mothers on the recreation piers in the cooking and serving of proper food.

(3) The Public Education Association, through its parents' meeting committee and in cooperation with the Society of Sanitary and Moral Prophylaxis, devotes its time to teaching of sex hygiene to the mothers' clubs of the public schools.

(4) The Public Health Education Committee of the American Medical Association, through women's clubs, parents' association, church organizations, settlements, and other groups, reaches large numbers of mothers and fathers. Its lectures are given by physicians, and in cooperation with the medical societies of New York and Kings Counties, courses of lectures have been given every year since 1909, and are very popular. Many of these lectures are on child hygiene.

(5) The People's University Extension Society also provides lecturers to settlements, institutions, schools, clubs, churches, libraries, etc.

These last two organizations provide lectures in other than the English language, if necessary. Both have child hygiene as one of many topics in their list.

Many of the organizations mentioned provide lectures for teachers' clubs and organizations as well as for parents, but, so far as I have been able to learn, no provision is made for the adequate training of teachers by either the Board of Education or any of the other organizations or schools for the training of teachers in the city of New York. Teachers' College, of Columbia University, offers a course in child study under a psychologist and in school hygiene, including a course on hygiene of childhood, under a physician and a nurse, but I can not discover that this latter course is comprehensive or practical, and the child study is primarily psychological, all hygiene being incidental. The School of Pedagogy of New York University is even less active, the courses offered there being on the "Physical nature of the child" and "Anthropological study of school children," but child hygiene is merely incidental. The training schools of the Board of Education offer nothing practical, and the physiology and hygiene they pretend to give are not so presented as to appeal to the teacher or student as important subjects.

The Board of Education, in its public-lecture courses, occasionally includes some topic of child hygiene. The Board of Health conducts a more or less vigorous campaign in health education—child hygiene included—and many of the settlements in cooperation with such organizations as the Public Health Education Committee of the American Medical Association, the Public Education Association, and others in the first list given are all actively engaged in teaching the public the importance of child hygiene.

A PLAN FOR TEACHING HYGIENE IN THE PUBLIC SCHOOLS.

Ira S. Wile, M. S., M. D., New York City.

The purpose of education is to protect the State from all dangers arising from ignorance, disease, moral degeneracy, industrial retrogression, criminality, and civic unrighteousness.

The state, as a form of social organization, is but a single type of social unit. The relation of the state to the city, on the one hand, and to the nation, on the other, has varied responsibilities. The family may be regarded as a social unit, but its status depends upon the development of the individuals comprising the various families. In the last analysis the strength of the nation is limited by the strength of the weakest individuals of which it is composed.

The basis of social education lies essentially in the socializing of individuals by the development of the latent social instincts into a definite, purposeful social consciousness.

Hygiene is the science that treats of the laws of health. Social hygiene is the science that treats of the laws of health in the broadest sense as related to the welfare of society as a whole. Social hygiene includes personal hygiene, family, municipal, state, and industrial hygiene.

The proper place at which to teach the basis of social hygiene is the elementary school. Ninety-four and one-half per cent of the school children fail to get above the elementary schools. The period of education in social hygiene should be within the period of compulsory education.

With a view to developing a logical course of instruction in social hygiene that may be useful to teachers, I have prepared the following suggestions for graded syllabic lessons, which are submitted with a realization of their imperfections. For some schools the plan may be regarded as too inclusive, while other schools may deem it lacking in some essentials. The plan is based upon a correlation of existent courses in nature study, physiology, hygiene, domestic science, civics, etc., without the introduction of new studies and without any additional cost to the educational authorities.

The success of this plan for teaching social hygiene must depend, as does every part of the school curriculum, upon the interest, spirit, and conscientiousness of the teacher.

The expression " dry as bones " aptly describes much of the present teaching of physiology and hygiene. In the mode of teaching the cart is placed before the horse. The average child will readily grasp and appreciate the facts that are essential to the correct mode of living, while it lacks the interest so necessary to stimulate attention to the weird assortment of anatomical and physiological statements that are supposed to form an essential part of the school curriculum.

Considerable knowledge of the close harmony of the various parts of the body may be acquired in a normal manner through the study of hygiene. The appreciation of the reasons for the hygienic principles that tend to prolong life and to promote bodily health necessitates an understanding of the most practical facts in anatomy and physiology.

Much stress has been placed upon the methods best adapted to the instruction of children in physiology, but only during the past few years has thought been given to the value of the information that is obtained by the present system of teaching the subject.

A careful analysis of the general subject of hygiene discloses the fact that it is based upon the consideration of a few fundamental topics that appear to be closely interrelated and that are the main factors in determining the physical and mental status of an individual or a community. Air, sunlight, clothing, exercise, rest, food, cleanliness, and order form the basic subjects that, in the aggregate with adequate discussion, constitute hygiene.

Society as a whole is built up of various units, all of which may be resolved into individuals. In the consideration of a method of approaching the subject so as to secure the greatest effectiveness for the teacher or the scholar, a synthetic method is far more valuable than an analytic method. To contemplate the universe and recognize the guiding principles that govern the planets and the nations as well might be an ideal exercise for a trained philosophic student. To understand the dominating rules of life as they apply to the individual and then to perceive the relation of these individual rules to the life of a family is far more reasonable for the child mind. To grasp the relation of personal hygiene to the health of the family is a stepping-stone to an intelligent conception of the relation of individual hygiene to the health of a group of families such as would constitute a neighborhood.

Further extension of the same principles of personal hygiene is involved in the understanding of the particular problems that are indissolubly connected with the city. The state, the nation, the world are three greater syntheses of a small social unit, the individual. Thus society may be regarded as a series of concentric circles, possessing the individual as a common center. The outermost circumference embraces all the other circles, though the area involved consists of an aggregate of individuals whose various combinations are delimited by the several lesser circumferences.

If one regards the few basic hygienic factors as centering in the individual, and going therefrom in direct lines that may be regarded as ever-lengthening radii of the concentric circles, there appears at once a simple system for the instruction of the young or the old in the general scheme of social hygiene. A careful and intelligent study of the laws of hygiene as they affect the individual leads to an intelligent appreciation of the relation of hygiene to civilization and organized society.

In an outline to cover various grades of the public school it is essential to get the bulk of the hygienic material into the curriculum during the period of time for which the maximum number of children are at school. This makes it necessary to grade a course in hygiene so that the main elements are disposed of before the sixth grade. The continuation of the development of hygienic themes is to be found in the upper grades of the elementary school and might well be carried throughout the secondary schools.

In arranging a syllabus of hygiene upon a social basis the units of social development must be considered. First comes the element of self or personal hygiene. During this period it is important to take up such fundamentals as position, breathing, cleanliness, the value of fresh air, sunlight, exercise, with some comment upon clothes, especially as related to the baby, the necessity for keeping them clean, etc. Foods must be treated in a most elementary way, but stress can be placed upon the use of coffee and tea, the eating of candy between meals, the ill effects of too much ice water. Stress may be placed upon the necessity of mastication. Rest plays a part in hygiene that might well receive attention in the very early grades. A sense of order needs development, as it is a fundamental of personal hygiene whose greatest value may be seen in the development of the hygiene in later years. Such a series of talks might well be correlated with simple experiments with animals and plants or instruction suggestive of how plant and animal creation keeps itself clean. Demonstration of the effect of sunlight on plants and animals will help to emphasize the advice given on these subjects.

The next form of hygiene to be evolved is that which contemplates the idea of another self. It is elementary altruism, the essential importance of protection of some one else. Under this head, naturally, would come such hygienic themes as the use of individual cups, toothbrushes, wash cloths, towels, drinking glasses, the dangers of contagious diseases, regard and respect for the health of others. At the same time there may be indicated the important idea that what is good for one is not good for another; the care of the bedroom, the necessity of open windows, undressing before retiring, the unhygienic use of feather beds, and similar other themes naturally suggest themselves. The subject of family pets, as cats and dogs, carries with it in content not alone the ordinary care of bathing and feeding, but is designed to introduce the love of animals and an understanding of what constitutes cruelty to animals. It includes the dangers that may arise from too close contact with animals more or less diseased. Fresh air carries with it suggestions relating to smoke and smoking and the importance of fresh air in rooms at all times. Dancing and its hygiene will bear many comments at this time. Again, such themes should be correlated with talks upon the familiar animals, as cats and dogs, and insects, and such plants as the common fruits, vegetables, and trees; while the effect of natural phenomena, of water, air, and sun, will help to make clear the hygienic applications.

The real essential unit which would be reached about the age of 9 years would be a discussion of the hygiene as related to the family. The interrelation of members of the household and the hygienic import of division of labor forms a basis for initiating the program. Home cleanliness, moderate temperature of rooms, proper airing and lighting, form valuable phases of family hygiene. The relation of dust to exposed foods, the dangers from flies and insect pests, all relate directly to this phase of family sanitation and hygiene. Isolation of the sick in the home, the importance of quarantine and disinfection give excellent opportunity for making the child understand the value of such health procedures.

The hygiene of study, as related to position, light, print, and intensity, will serve the school as well as the home if dwelt upon at this particular age. This bare suggestion of themes may well be correlated with the life history of the bees and the ants, bird life, and the schools of fish; forestry and sown fields. The effect of the sun and the development of warmth, the seasons, all serve further to explain this phase of social hygiene.

With the grouping of families, neighborhoods are constituted. There is immediately a recognition of the interdependence of families for food, clothes, and similar other necessary commodities. The hygienic value of the golden rule may be pointed out without dwelling upon its religious aspects. The nature of disease, its spread by microbes, the relation of the individual to an epidemic, represent some of the hygiene of this period. Removal of garbage, the importance of clean back yards, the unfairness of careless sweeping. shaking dusty rugs or garments out of the windows, are all part of neighborhood hygiene. The relation of the school medical inspectors and nurses indicate the relation of the neighborhood and the school in the protection of individual homes. The school and its hygiene, as it relates to lighting, ventilation, open-air schools, toilet facilities, crowding, may be carefully developed by the thoughtful teacher. Naturally, there grows from this all that relates to the prevention of disease in school, the individual pencils, vaccination, exclusions for contagious disease. the importance of lessening physical defects. There may be correlated, in explanation of such topics, a study of the zoo, of the jungle, or the aquarium, the forests, the fields in the form of gardens, while mountains and rivers and islands and continents present natural phenomena in geography that are also instructive.

The interrelation of neighborhoods results in the formation of a city whose hygiene is again a development of the original lines of thought. Again, the problem of removal of garbage and ashes, the questions of street cleaning and proper sidewalks require discussion. The freshness of the air involves soft-coal nuisances and smoking lamps, and the growth of the subject to a consideration of indoor work and dusty trades is but a natural expansion of the original theme. The importance of congestion, tuberculosis, the value of food ordinances, the dangers from an impure water supply, the tremendous gain through isolation and segregation in contagious diseases, represent useful topics in municipal hygiene that might well be taught to the children in the prepubertal period. The value of trees, the relation of city lighting, the connection between the city beautiful and health, even, indeed, the necessity of city planning, would be embraced in a plan of social hygiene as related to city problems.

It is unnecessary to go further in the development of our program. I believe the suggestion is clear without further elaboration. The plan, in brief, is to consider the evolution of hygiene in an elementary school upon the basis of the evolution of society, and to so arrange the information to be given to the children that it will be adapted to their age, grade, and experience; while, at the same time, the course is naturally developed from a single point of view instead of being thrown into a curriculum without plan or thought and too frequently left to the discretion of the teacher.

The importance of correlating all the topics in hygiene to natural history, geography. civics, and economics is not to be overestimated. If public schools are to prepare for citizenship, it may be recognized that a citizen who is conscious of his hygienic duties and sanitary responsibilities is of far greater value to a community than one who is brought up in ignorance of these important topics. The main feature that I would call attention to is that hygiene is taught as a subject by itself, and the physiology is drawn in, as it were, through a discussion of the hygienic problems, instead of appearing as a formal subject on the program. Anatomical details are entirely omitted, inasmuch as, to the child in the elementary school, they are of no value theoretically or practically, save in so far as they have some relation to his every-day life. In the higher grades, it might be desirable to take up the subjects of anatomy and physiology, as formal studies, but, in that case, the perspective will be, practically, hygiene, and the interest of the children in the subject will be enhanced, whereas, under the present system, it is merely a test of memory.

The social hygiene instruction is constituted practically from the educational content of the various subjects already on the curriculum. It is necessary to so correlate history, civics, domestic science, physical education, geography and similar subjects, that they will all bring to social hygiene their proper latent forces. The general result will be an improvement in the standard of health of the individual children, and a marked betterment of the hygienic conditions of the community in which such children grow to become citizens.

DISCUSSION.

Dr. Frank Warner, Columbus, Ohio: In many of the smaller communities it is not often possible to follow the plans of teaching hygiene that may be applicable to New York, Berlin, or any of the great medical centers where skill, training, and money are all available in an unlimited way. In the smaller communities, the teaching of hygiene should be combined with the duties of the medical inspection of schools. And even then many of the inspectors will need to be taught that there are broader duties devolving upon the position than looking for adenoids, enlarged tonsils, defective vision, and contagious diseases, as valuable even as this work is. These matters should be taken up through the various medical societies through the various countries here represented, to the end that more uniform and better work be accomplished; remembering all the time, however, that the work of teaching hygiene in the schools ought to be adapted as far as possible to the community in which the work is to be done.

OPEN-AIR SCHOOLS AND OPEN-AIR INSTRUCTIONS WITH BREATHING EXERCISES IN SCHOOLS AND COLLEGES TO PREVENT TUBERCULOSIS AND OTHER DISEASES.

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Among the many telling sentences in that brilliant presidential address of Prof. Wm. H. Welch, of Baltimore, delivered at last year's meeting of the National Tuberculosis Association in Denver, there is one that reads as follows:

> In the light of our newer knowledge, there is abundant reason for the ever-increasing emphasis placed upon the importance of attacking the problem of tuberculosis in the early years of life.

There is no question in the mind of any worker in the tuberculosis field that this portion of our tuberculosis crusade is, indeed, not only the most important, but also the most difficult one to deal with. The 5 to 10 per cent of tuberculosis in childhood, which can be traced to the bovine type of the bacillus, would seem almost the easiest part to prevent. This could be done by the wise enactment and judicious enforcement of bovine laws, but, in order to be effective, these laws, as well as their enforcement, must emanate from the force of our central Government. Individual State laws are of little use as long as they differ from each other, are reasonably severe in one community, and ridiculously slack in the next. Bovine laws must be enacted and enforced uniformly, and this is only possible with the aid of a Federal department of health. With such laws, enforced by the supreme power of the United States Government, it is my firm conviction that the bovine type of tuberculosis can be annihilated within a decade. I believe that the 10 per cent of deaths we now have from this form of tuberculosis in childhood can be prevented; that the economic loss accruing to a community because it has educated 5 per cent of its children at the age from 8 to 14, and then had them die from a preventable disease, can be saved; and, last but not least, that the vain sacrifices made by parents, the sorrow and agony they had to experience through the untimely loss of beloved children, may be spared to them. Let those who still oppose the creation of a Federal department of health take this to heart, and remember that by their opposition they must be held responsible for the untimely deaths of thousands of American children.

Although but a small percentage of tuberculosis due to the human type of the bacillus can be traced to direct bacillary transmission via placenta, we all know that postnatal infection from either parent, but particularly from the mother, when tuberculous, is one of the most frequent causes of the disease in childhood.

It is not within the province of this paper to speak of the prophylactic measures and regulations which should prevent tuberculous procreation. I have very strongly expressed my views on this subject in other publications, to which I must refer my readers.[1] I am here to-day to tell you what I believe might be done for the child who is tuberculous or is likely to become so by reason of a predisposition inherited or acquired.

It is very easy to say "take away the tuberculous child from its tuberculous parents, raise it in the best of hygienic environments, give it good food and plenty of air, and you will overcome the tuberculous predisposition or cure the infected child."

That such a procedure can be inaugurated only in the smallest number of cases must be evident to all who have studied tuberculosis, not only from its medical but also from its social aspect. In the majority of cases the separation of the child from the mother is out of the question. A beloved teacher of mine, the late Prof. Grancher, of Paris, thought to solve the problem by placing the children of tuberculous parents residing in the city of Paris in country homes as early as possible, having them there supervised by the local physician and returned to the parents when, in his opinion, children had grown to be vigorous and strong enough to resist invasion of the bacilli. He called his work "Œuvre de preservation de l'enfance contre la tuberculose." The work is still carried on by the widow of that great master and lover of children. That this work accomplishes a great deal of good there can be no doubt. The only question which there can be is whether it is not possible to accomplish a good deal more by removing mother and child or the entire family into the more sanitary quarters of the city and teaching them all hygiene and outdoor life and sending the children in time to open-air kindergartens, open-air schools, and open-air colleges.

To place not only the child but the mother as well—in fact, the entire family—in hygienic environments, where they may breathe good air, have clean, well-lighted rooms, perhaps so arranged that outdoor sleeping is feasible, and where there is medical supervision, would seem far superior to the separation of child from mother. By this method the whole family would receive the benefit of preventive and curative care.

While the out-of-town districts would be ideal for such homes of tuberculous families, it seems that even a great city, when it has citizens public spirited enough to devote their fortunes to so laudable a purpose, may have such a home hospital. A beautiful example of a sanitary home for tuberculous or predisposed families exists now in the city of New York, at Seventy-eighth Street and John Jay Park. It is known as the East River Homes and was built by the generosity of Mrs. William K. Vanderbilt, sr. Here a number of families with members who are strongly predisposed to tuberculosis or have recovered from the disease receive the advantage of almost ideal homes, with every room lighted and ventilated and with all modern sanitary improvements, for a most moderate sum. To give also to such families where the breadwinner is yet an invalid or not strong enough to support a family the advantage of such a home, the New York Association for Improving the Condition of the Poor has leased for three years an entire section of the East River Homes. This section consists of 24 apartments with a southeastern exposure. The trustees of the East River Homes have given the association entire control of the open stairway leading to these apartments and free access to and partial control of the ideal roof garden. These families will be carefully supervised by physicians and nurses.

On top of the Vanderbilt houses are beautiful roof gardens which, I understand, will, as soon as possible, be utilized as open-air schools. However, open-air schools, open-air kindergartens, and outdoor play facilities should not only be provided for the tuberculous and the tuberculously predisposed, but for all children, if we wish to combat tuberculosis as a disease of the masses. In the city of New York, for example, where, owing to the density of population and the topography of the island, playgrounds and small parks are necessarily limited, we have nevertheless thousands of acres of unoccupied, unutilized roofs which could easily be transformed into open-air schools and playgrounds. Of course, we have made a beginning in New York, but our efforts have thus far been limited to the care of a very small number of tuberculous and anemic children.

We have at this time in New York City 12 open-air classes connected with the public-school system. According to the statistics kindly furnished me by Dr. Thomas S. Carrington, assistant secretary of our National Tuberculosis Association, the number of pupils attending these 12 public schools is 526. The 12 open-air schools in New York City are as follows: Seven fresh-air classes, located at Mott and Spring Streets, 57 West Forty-fourth Street, 272 East Tenth Street, Eldredge and Hester Streets (for boys), Eldredge and Hester Streets (for girls), West Twenty-eighth Street (for boys), West Twenty-eighth Street (for girls); four open-air classes, located at Bellevue ferryboat, No. 2 Bellevue ferryboat, Vanderbilt Clinic, ferryboat *Middletown*; one open-air school on ferryboat *Susquehanna*, Brooklyn. Besides these classes of the public schools, the Horace Mann School established last year an open-air class with 40 pupils taken from the primary grades, and the Society for Ethical Culture announces that it will establish an open-air school, for 60 pupils of the fourth, fifth, and sixth grades, on September 25, 1912. This would give to New York City 14 open-air schools, with a capacity for 626 children coming from all classes of society.

For the rest of the United States there are, according to the following statistics, also kindly furnished by Dr. Carrington, at this time in operation 41 schools, accommodating 1,229 pupils. To this must be added 4 summer schools, and for the coming year there are projected 8 open-air classes in the cities mentioned:

List of open-air schools in the United States.

City.	Number of schools and classes.	Number of pupils.	City.	Number of schools and classes.	Number of pupils.
Monrovia, Cal	1	....	Albany, N. Y	1	25
Oakland, Cal	1	25	Buffalo, N. Y	1	20
Colorado Springs, Colo	(1)	....	Schenectady, N. Y	(1)	....
Denver, Colo	(1)	....	New York City	12	526
Hartford, Conn	1	25	Rochester, N. Y	1	30
South Manchester, Conn	1	20	Syracuse, N. Y	(1)	....
Washington, D. C	1	35	Cincinnati, Ohio	2	40
Chicago, Ill	(2)	....	Do	[5] 1	35
Do	6	[3] 250	Columbus, Ohio	[6] 2	....
New Orleans, La	2	160	Hazelton, Pa	1	40
Boston, Mass	[4] 5	100	Mount Airy, Pa	1	30
Cambridge, Mass	1	30	Philadelphia, Pa	3	[3] 75
Grand Rapids, Mich	2	[3] 40	Pittsburgh, Pa	2	75
St. Paul, Minn	(1)	....	Williamsport, Pa	(1)	....
Montclair, N. J	1	21	Pawtucket, R. I	1	25
Newark, N. J	1	30	Providence, R. I	1	25
Orange, N. J	2	43	Kenosha, Wis	1	30

[1] Not yet in operation. [3] Approximately. [4] Classroom. [5] Open-air room. [6] Schools projected.
[2] Tuberculosis Institute School (three or four extra schools during summer months).

The results obtained in open-air schools is well known to all who have been privileged to examine and watch the children. I could fill these pages with testimonials calculated to make of any and every body an enthusiast, but I shall only quote a few authoritative statements and not omit the more conservative ones. The latter are, to my mind, as significant as the former. Thus, in the medical report on "Outdoor classes for anemic children" for the year 1911–12, kindly furnished me by the courtesy of Mr. Mann, the secretary of the tuberculosis committee of the C. O. S., and Dr. Woodruff, the physician in attendance, the conclusions are as follows:

> First. That in the special outdoor classes for anemic children as at present conducted subnormal children improve in mental and physical tone, in the iron content of their blood, and, to a certain extent, in nutrition.
>
> Second. That the improvement in nutrition and gain in weight may possibly be dependent to some extent on the food received in the school.
>
> Third. That the gain in hæmoglobin bears no relation to the amount or character of the food given in the school, but is due, in all likelihood, to the effect of continuous life in the fresh air day after day.
>
> Fourth. That the effect of the outdoor class is not or may not be transitory.
>
> Fifth. That from the study of the "control classes" and the children discharged from the anemic class at Public School No. 21 it is likely that the environment of the ordinary classroom has some deleterious effect during the winter, at least, which tends to produce an anemia.

An interesting statement concerning results for the first outdoor school in the United States, and more optimistic, was published in the Journal of the Outdoor Life for March, 1909, by Mr. Walter H. Small, at that time superintendent of the Providence schools. After describing the interest the general public had taken in this first open-air school, he said:

> The school enrollment is varying, and the work is necessarily individual. Each does what he can; he is not urged, but he sits in the sun, keeps healthfully busy, drinks in fresh air, and grows stronger physically and more alert mentally. To see the color come into the cheeks and the sparkle into the eyes, and to see the emaciated form fill out, convinces those close to the work that it pays abundantly.

The result of the first outdoor school in Chicago is indeed surprising. It was kept open only one month. There was a gain of from 1 to 7 pounds, and, considering the general condition, Principal William E. Watt, of the Graham School, expressed himself as follows:

> The children are delighted to breathe pure air all day in school and out. They are not compelled to stay in the room, but there are many more clamoring to get in. It has been a most successful experiment. Pupils have been cured of catarrh, swollen glands have been reduced to normal size, and tuberculous symptoms have disappeared. Their resistance to disease has been raised, and they are much more healthy.[2]

Because in New York City the open-air schools connected with the public-school system have been primarily intended for tuberculous or predisposed children, the following report of Prof. Maxwell, superintendent of the city public schools. for the year 1911, is highly instructive:

> The city of New York has incorporated in its school system outdoor classes in the regular school buildings during the school year for anemic children, children predisposed to lung tuberculosis, and children with other organic troubles, such as heart disease. Secondly, tuberculous classes for children who are excluded from the regular schools because they are afflicted with open tuberculosis. The board of health excludes from the public schools all children afflicted with this type of tuberculosis.
>
> In order to try the effect of the open-air treatment on these children, the authorities of Bellevue Hospital assembled a number of them on a ferryboat. Here they were kept in the open air during the day, were fed and were under medical supervision. They slept at home. Not having anything to do all day, the children tired and asked that a teacher be allowed them. Thus, began the relation of the school system with classes of children excluded from it. There are now classes for tuberculous children on four ferryboats, moored to docks on the East River front, and two classes on the roof of the Vanderbilt clinic. These classes are annexes to the following schools: Public School 12, Manhattan; Public School 14, Manhattan; Public School 37, Brooklyn; Public School 141, Manhattan; and Public School 151. Manhattan. Pupils to the number of 474 attended these annexes last year, and 25 per cent of these were discharged as cured, or "disease arrested." Children to the number of 136 were returned to the regular schools, and 12 went to work. In connection with the number 136, it must be noted that a child once excluded from the regular schools can not be readmitted to such schools until the board of health gives it a clean record of health. In this 136 are also included some children who were excluded for observation and were returned as nontuberculous.
>
> Some interesting facts in connection with these classes are the following: About two-thirds of all the children admitted were taken from classes in the first four years of school life.
>
> Four of the five schools report that 316 children gained in weight, 34 lost in weight, a few showed neither gain or loss, and, in five cases the weight was not recorded. A girl of 13 made the greatest gain in weight, viz, 38 pounds in nine months; among the boys 22 pounds was the record gain.
>
> Among the children, who gained in weight, the average for the girls is a little higher than that for the boys; among those who lost, the average for the girls is somewhat greater than that for the boys.
>
> Ten degrees Fahrenheit was the lowest temperature recorded in any of the classrooms during the year. It was registered in the classroom on the roof of the Vanderbilt clinic during the month of December. The lowest average temperature for the months of December, January, February, and March was 29° F.; it was registered on the ferryboat foot of East Ninetieth Street. The highest average temperature was recorded in Public School 37, Brooklyn, on the ferryboat *Susquehanna*.
>
> About 59 per cent of the pupils admitted to these annexes had pulmonary tuberculosis in the first stage, about 15 per cent in the second stage, and about 4 per cent in the third stage; the others had latent pulmonary tuberculosis,

tuberculosis of the glands, or were held for observation because they were doubtful cases.

The teachers are told that the health of the child is the main consideration, and that school work must be sacrificed to gain it. A child physically incapable of keeping up to grade, unless it exerts itself more than its physical condition will permit, is not allowed to make the effort. It is a pleasure. however, to report that the majority of the children hold their own while in these classes, and that some of them do better work than they did in the regular schools.

The equipment, cost of feeding. character of feeding, clothing, rest, recreation, medical supervision, and so forth, have been so often described[3] that I will not enter into the consideration of these subjects here. Suffice it to say that it pays in the end in health, happiness, and economic gain to take care of these tuberculous and tuberculously predisposed children at the right time and in the right place.

To the two types of classes for outdoor instruction (outdoor classes in regular school buildings for the predisposed and outdoor schools for those afflicted with open tuberculosis) there should of course be added that type of schools which are known in Germany as "Waldschulen." These are of course mainly feasible in summer, but will be of inestimable benefit to the nervous, anemic, scrofulous, poorly nourished children, all of them strongly predisposed to tuberculosis.

A system of such "Waldschulen," or vacation schools, it should be the ambition of every city to possess. All these types of schools should be multiplied manyfold. I go so far as to say that if we really mean to wipe out tuberculosis from among the coming generation, open-air schools and open-air instruction should be the rule, indoor schools and indoor instruction the exception. If it is true, as it has been stated, that the child handicapped by so serious a disease as tuberculosis, anemia, or scrofulosis, when instructed in the open air, not only holds its own, but often does better work than the healthy child raised and instructed indoors, what may we not hope from outdoor instruction given to the healthy child throughout its school career? And, in "school career," I include a kindergarten course. This latter institution because, unless it is attached to a public school where the school physician is on guard, it rarely has medical inspection, is, to my mind, a fruitful propagating ground of infectious diseases. Most frequent of these are the mysterious colds which the little ones bring home, and which, upon investigation, it is shown that all the children have. I am convinced that the open-air kindergarten would do away, not only with these so-called colds (which are infectious), but also diminish the number of other infectious diseases to which children are so prone.

And now a word as to instruction in the open air in higher grades; that is to say, in high schools and colleges. I know, of course, that there are a number of branches in the curriculum of the high schools and colleges which can not be taught outdoors or in an open-air class, but many branches can, and I know, from personal experience, and from the reports of army surgeons in Germany, that recitation and singing in the open air is very conducive to health, and to the development of sound lungs and a well-formed chest. Thus Barth, of Koeslin, Germany, made a careful study of the effects of singing on the action of the lungs and heart, on diseases of the heart, on the pulmonary circulation, on the blood, the vocal apparatus, the upper air passages, the ear, the general health, the development of the chest, on metabolism, and on the activity of the digestive organs, and has come to the conclusion that of all exercises singing is the most conducive to health. Considering the fact that it can be practiced everywhere (where the air is pure), or at any time, without apparatus, it should be much more cultivated than it actually is. The German military authorities, who have the reputation of instituting all exercises which tend to invigorate the soldiers, have of late years encouraged singing during marches of all troops.

Botanical and geological excursions are, I believe, not nearly frequent enough in our public schools. From personal experience I know the inestimable value of such, as far as physical development is concerned. Certain studies can, I believe, also be better pursued outdoors than indoors. The authorities of the Ethical Culture School, evidently realizing the benefit derived therefrom, make the following statement in their recent announcement of open-air schools for anemic and nervous children:

> During the fall and spring there will be frequent excursions to the outlying country for the purpose of securing country air and environment. These offer possibilities in the way of recreation, nature study, and concrete material for geography, arithmetic, and all school work.

Let instruction in the open air be carried out more universally in high schools for young men and women, whenever feasible, as well as in primary schools, and I guarantee a stronger and better race physically within a decade, with no intellectual impairment whatsoever. I go even so far as to venture the statement that if giving the course of studying mostly in the open air renders it possible for the tuberculous child to accomplish as much and more in shorter hours and shorter sessions, the hours and sessions for the normal pupil of primary school, high school, and college may also be shortened by this hygienic mode of studying and teaching.

Although I am personally opposed to home lessons for children attending primary grades, older children will of necessity have to study at home sometimes. After having spent all day in the open air they will dislike to be shut up for home study. For these children I recommend that an open-air study room be arranged at home by the utilization of some portion of the roof or porch. If the parents do not own the house or the landlord is not gracious enough to give permission for the utilization of either roof or porch for that purpose, I suggest the following device: In front of the ordinary American window, raised from below as far as possible, place the worktable for the child. In winter he sits in front of it, warmly wrapped up, on a comfortable chair to do his lessons. Around him, inclosing table and window, is placed a large folding screen or waterproofed canvas-covered frame, with another piece to form a top, as high as the window will open. This will form a tiny room in front of the window for an outdoor study. The center of the screen should contain a celluloid window, so as not to take too much light from the room and also for the purpose of watching the child. By this arrangement the rest of the room will neither be rendered too cold nor too dark for the other members of the family. With outside shutters, which can be closed in stormy weather or at night, studying in the open air can be carried on day or evening and in all kinds of weather.

This arrangement is, of course, primarily intended for use in winter; it would hardly be necessary in warm weather.

Before discussing the second portion of my paper, referring to breathing exercises, I must say a word on the architectural side of the problem of open-air schools.

To abandon all old-type schools for new ones would be an expenditure far beyond the present financial ability of most communities. Hence the question arises, What can be done with the existing buildings, and how can we construct new schools most economically and serviceably, with a view to getting as many open-air schools as possible?

The qualifications of an expert architect and a physician versed on the subject under consideration are rarely combined in one man. I, for one, at least fully acknowledge my deficiency in architectural knowledge, and, to be of some real service to the cause, I have again consulted my old friend and fellow student, Prof. John V. Van Pelt, of the school of architecture of Columbia University, who has helped me before with his wide experience in plans for ideal sanatoria, open-air model tenements, and other sanitary constructions. I have submitted to him my ideas and conceptions of what an open-air school should be and the object it should serve. He has prepared for me some plans showing how open-air classrooms can be so constructed on the roofs of existing school buildings, or how any story of the building can be made to serve as open classrooms, and, lastly, he has drawn for me an ideal open-air school. I wish to thank Prof. Van Pelt for this invaluable cooperation in a cause so dear to my heart.

And now as to the value of breathing exercises, which I should like to see incorporated in the curriculum of every school, from kindergarten to university, to be performed at recess and gradated according to the age, intelligence, and strength of the pupil.

I have often taken the measurement of children of tuberculous parents and of others who were brought to me because of their undeveloped physique. After a few months of exercises they almost invariably improved in general health and grew correspondingly stronger than they had been before taking the exercises. It has also been my privilege to teach respiratory exercises to physicians and students with gratifying results. The first time I published a system of respiratory exercises which I had worked out was in my doctor's thesis, "Les sanatoria, traitement et prophylaxie de la phtisie pulmonaire," which I defended before the Faculty of Medicine in Paris in 1895. I published them later in my textbook on tuberculosis, "Pulmonary tuberculosis; its modern prophylaxis and the treatment in special institutions and at home," and reproduced them in my international prize essay "Tuberculosis as a disease of the masses and how to combat it." I have had the good fortune of seeing the latter printed in 27 different countries and 24 different languages.

Such or similar exercises are now, I believe, practiced and taught by a goodly number of physicians engaged in the work of the prevention of tuberculosis. In Paris such exercises have been adopted in some of the public schools. Dr. Marage of that city recently published some interesting statistics showing the results of having breathing exercises practiced by a number of pupils several times every day for a period of six months. The experiments were made at the communal boys' school, in the Rue Gambon, under the control of Prof. Meunier, Madame Meunier, and a number of teachers. It was observed that the children learned the exercises easily and performed them with pleasure. There were fewer absences from school during the six months of experiments than during the other part of the year. The results were universally good, especially in sickly children.

The following is a table showing the gain of height, chest capacity, and vital capacity:

Results of series of experiments on children by Dr. Marage.

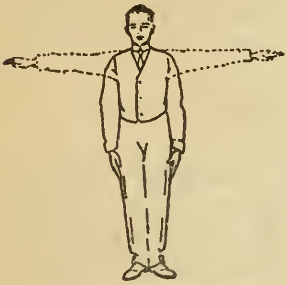
Age.	Height in centimeters.		Chest girth in centimeters.			Vital capacity in liters and centiliters.			Number of pupils.
	Beginning.	Sixth month.	Beginning.	First month.	Sixth month.	Beginning.	First month.	Sixth month.	
6 years	115	118	51	53	57	0.54	0.78	0.85	19
7 years	125	125	52	55	59	.66	.80	.93	14
8 years	124	126	53	56	60	.79	.86	1.13	27
9 years	130	132	55	59	63	.89	1.00	1.17	29
10 years	141	143	59	62	64	1.20	1.36	1.51	28
11 years	138	142	58	62	66	1.05	1.31	1.70	18
12 years	145	149	59	63	67	1.47	1.67	1.95	22
13 years	148	151	70	74	77	1.93	2.26	2.26	16
14 years	147	153	62	66	74	1.83	1.92	2.15	7

Encouraged by the results obtained by myself and others from these respiratory exercises, I have taken up their study anew and publish and illustrate for the first time in this essay a much more complete system of respiratory exercises adapted to the development of the lungs and the improvement of the respiratory system in general.

In the working out of this new and improved system of respiratory exercises it has been my aim to bring into play all the muscles of the body from the head down to the toes, including the abdominal and dorsal muscles, and yet avoid the possibility of exercising any one of the muscles too violently. Exercise H, whereby a great deal of residual air is expelled, and consequently a greater interchange of air takes place, producing a better haematosis, has given me particularly gratifying results. I have been able to increase the chest expansion in a number of young persons and children from 1½ to 2½ inches within three months.

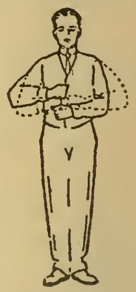
As soon as the intelligence of the growing child will permit, it should be taught to breathe deeply, and later on be taught to take the following breathing exercises, which it should learn to love as the average boy or girl loves general gymnastics: (A) In front of the open window or out of doors it should assume the position of the military "attention"—heels together, body erect, and hands on the sides. With the mouth closed it takes a deep inspiration (that is, breathes in all the air possible), and while doing so raises the arms to a horizontal position; remains thus holding the air inhaled for from 4 to 5 seconds, and while exhaling (breathing out) brings the arms down to the original position. The act of exhaling, or expiration, should be a little more rapid than the act of inspiration.

The act of inhalation occupies about 4, the act of exhalation about 3 seconds, and, as has already been said, the act of retention of the air about 5 seconds. The child should be taught to count mentally during these three acts, so as to be systematic about holding the air. One can move the hand upward and downward twice counting four, and on the fifth second begin to exhale while lowering the arms.



Respiratory exercise A.

When the first exercise (A) is thoroughly mastered, one may begin with the second exercise: (B) Place the arms, one above the other, in front of the chest, giving the hands a position as though wanting to tear open the chest. Then hands, arms, and shoulders make a backward movement (the fingers remaining bent) while one takes a deep inhalation; then count 4 by tapping the chest four times with both



Respiratory exercise B.

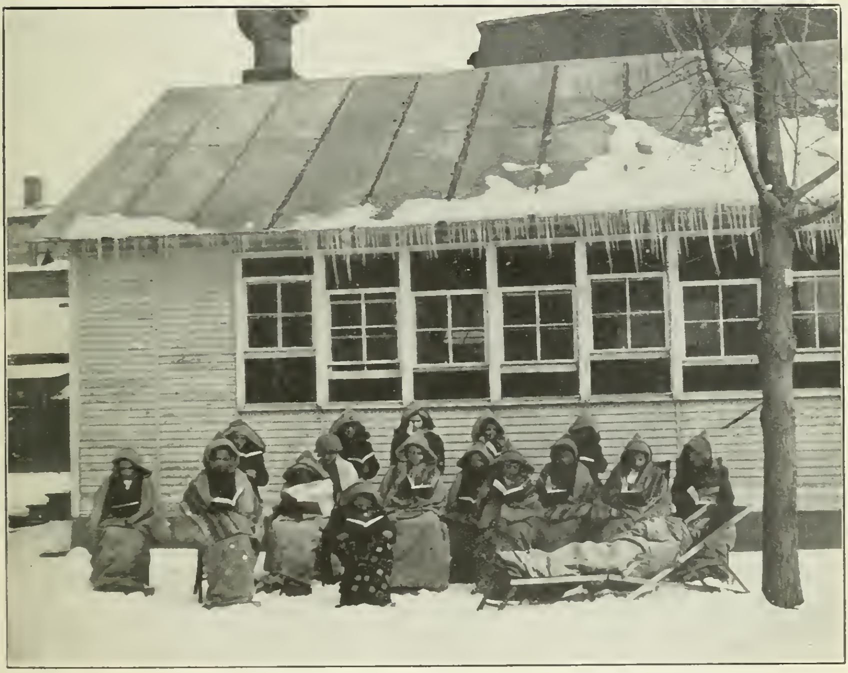


Fig. 1—PORTABLE OPEN-AIR SCHOOL AT JAMAICA PLAIN, BOSTON; PARTICULARLY SUITABLE FOR VILLAGES AND SMALLER COMMUNITIES.

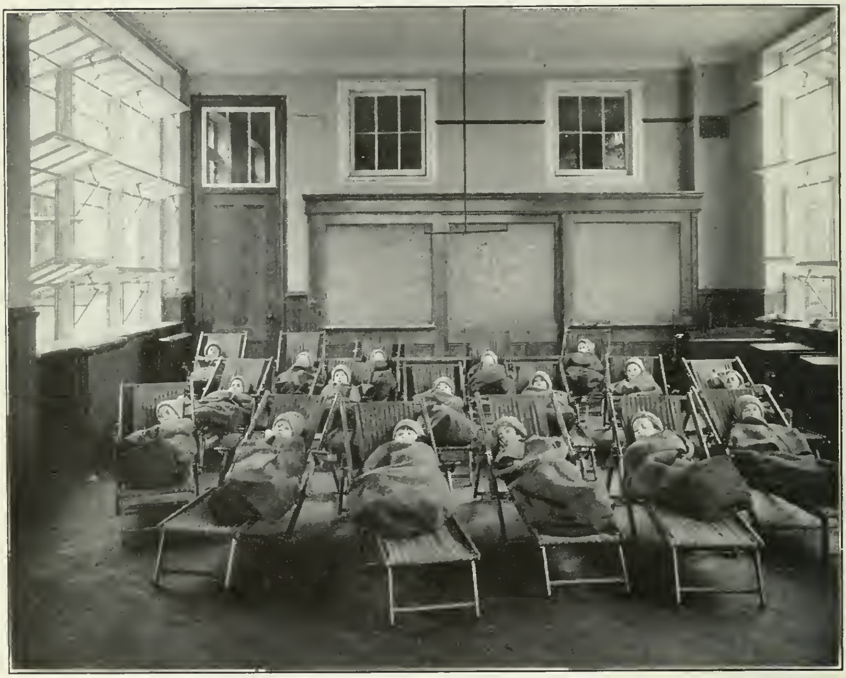


Fig. 2.—REST-HOUR IN AN ORDINARY SCHOOLROOM TRANSFORMED INTO AN OPEN-AIR CLASS.

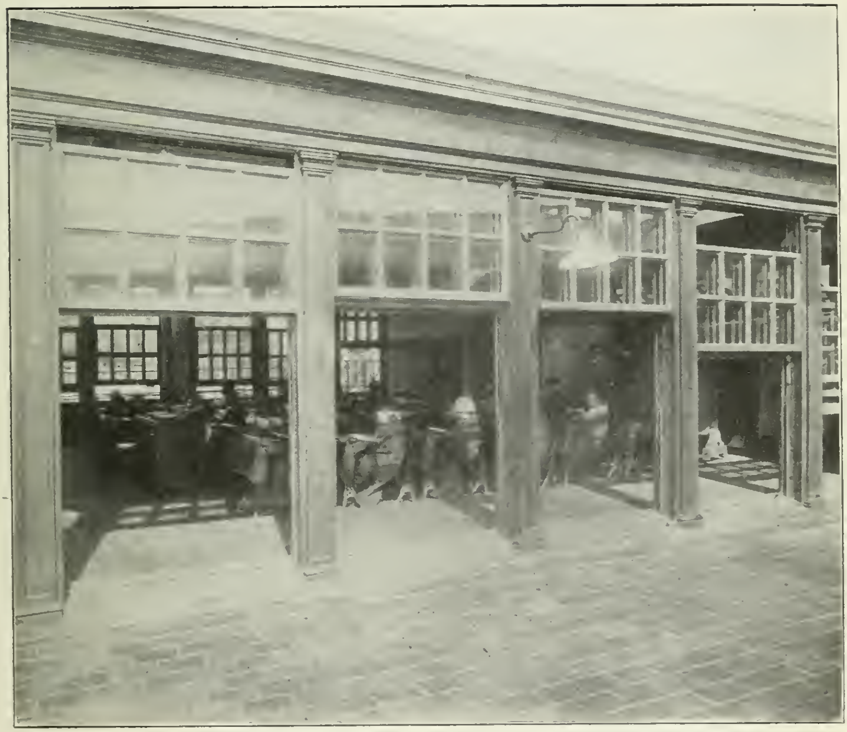


Fig. 3.—OPEN-AIR CLASSROOM ON ROOF OF SCHOOL BUILDING.

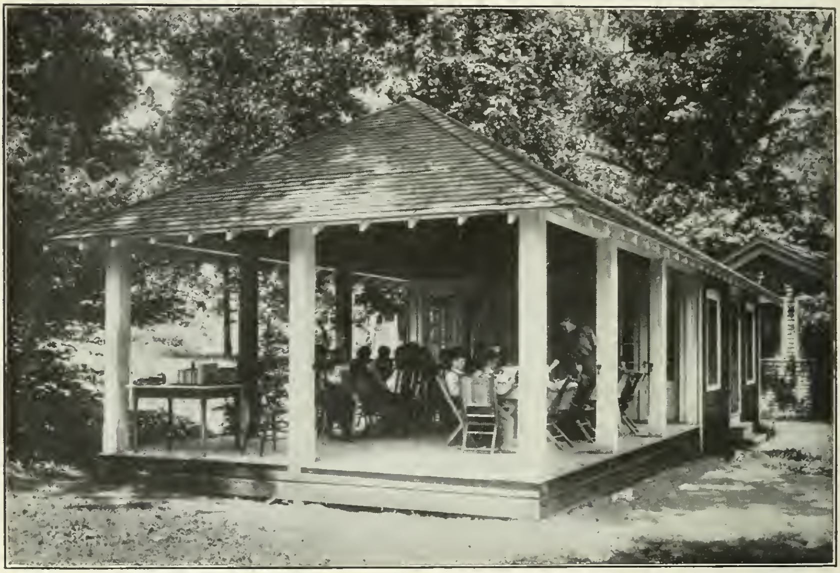
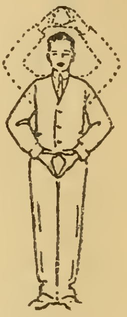


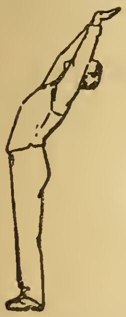
Fig. 4.—FOREST-SCHOOL PAVILION AT CAMP ALGONQUIN.

hands, and at the fifth second start to exhale, bringing the hands and forearms into the position from which they started. This exercise has the advantage that it can be taken in the sitting position, or even when lying on the back.

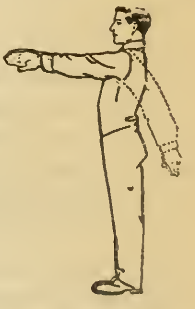
The third exercise (C) consists in raising the arms from the sides to the horizontal, and then above the head, taking a deep inhalation during this act; then bending backward as far as one can and remaining in that position 4 seconds while retaining the air (counting the seconds by moving the hands alternately forward and backward twice), and on the fifth second exhaling gradually while resuming the original position. During this exercise it should be borne in mind that when the arms are raised until the hands join one should not bring the arms close to the head, but rather form a circle above the head by bending the arms outward enough so that the meeting of the index fingers and thumbs form a triangle.


Respiratory exercise C.

The fourth exercise (D) is for the purpose of bringing the abdominal muscles also into play, or, in other words, combining abdominal and chest breathing. To this end one assumes an erect position, as in the beginning of all the exercises, the hands meeting in front with the little fingers and the edge of the palms touching the abdominal muscles. While taking a deep inspiration, raise the diaphragm, concentrating all attention on this act; and, while doing so, move the joined hands upward, sliding them along the thorax up to the chin; then turn them and continue to raise them until they are above the head. Bend backward during the four seconds, while retaining the air, and then exhale, lowering the arms gradually to the horizontal, and to the original position of "attention."


Respiratory exercise D.

The fifth breathing or respiratory exercise (E), which may also be called a dry swim, requires more strength and endurance. It should not be undertaken until the others have been practiced regularly several times a day for a few weeks, and until an evident improvement in breathing and general well-being has been observed. One takes the usual military position of "attention," and then stretches the arms out as if in the act of swimming, the backs of the hands touching each other. During the inspiration one moves the arms outward until they finally meet behind the back, remaining in this position for the usual four seconds, counting while moving the


Respiratory exercise E.

hands and while retaining the air, and on the fifth exhale bringing the arms forward again ready to start for another swim; or, if this is the end of the dry swim, the arms return to the original position of "attention."

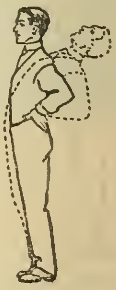
This somewhat difficult exercise can be facilitated, and be made more effective, by rising on the toes during the act of inhalation and descending during the act of exhalation.

Respiratory exercise F.

It will be seen that, with the aid of these five respiratory exercises, every muscle of the body is put into play. The face alone is at rest, and can serve as an indicator that the exercises are properly done, for it must be borne in mind that they must be taken without any undue tension of the muscular system, and tremorlike movements must be avoided.

In time, the desire for deep breathing will be constant. Of course, when out of doors, one can not always take these exercises with the movements of the arms without attracting attention. Under such conditions, one can assume quietly a position similar to "attention," and perform exercise (F). Raise the shoulders, making a rotary backward movement during the act of inhaling; remain in this position holding the breath for four seconds, and then exhale while moving the shoulders forward and downward, assuming again the normal position. This exercise (F) can be taken easily while walking, sitting, or riding in the open air.

Some girls and boys, especially those who are predisposed to consumption, often acquire the habit of stooping. To overcome this the following exercise (G) is to be recommended. The child makes his best effort to stand straight, places his hands on his hips with the thumbs in front, and then bends slowly backward as far as he can during the act of inhaling. He remains in this position from four to five seconds, while holding the breath, and then bends forward again, somewhat more rapidly, during the act of exhalation, assuming the original position with hands on hips.



Respiratory exercise G.

The following general rule concerning breathing exercises should always be remembered: Commence with the easier exercises (A), and do not begin with the more difficult ones until the former are completely mastered. Take from four to six respiratory exercises, one of (A), (B), (C), (D), (E), (F), or, when outdoors, simply exercise (F), four to six times every half hour or hour, or at least four to six times a day, and on rising in the morning and retiring at night. Continue this practice until deep breathing has become a natural habit. These exercises should always be taken in an atmosphere as fresh and as free from dust as possible. Never take these breathing exercises when tired, and never continue so long as to become overtired. We repeat once more the important injunction that the muscles of arm and forearm or any of the other muscles should never be on a tension during the respiratory exercises, but rather relaxed, so as to avoid the expenditure of unnecessary muscular energy.

These exercises are, of course, destined for children who are not as yet tuberculous, and they should be taught gradually and according to the strength, development, and understanding of the child. It must be evident that these exercises, which I believe are of incalculable benefit as a means of helping a child to overcome a tuberculous predisposition, are not indicated in all cases. They can do harm if the child is very delicate and not judiciously advised and guided in the gradual development of its physique in general. They will never be harmful in the healthy child if not overdone. Children, as a rule, take kindly to these exercises, and their love for fresh. pure air and distaste for foul air becomes very strongly developed. There should be no fear that in so-called flat-chested children the bony structure will not yield to the pressure exercised from within. Thus, with the aid of such respiratory exercises, a flat or hollow chested child can develop into a good, strong, broad-chested man or woman.

Besides the above-described exercises, there is one more which the older child, particularly after having learned all the other movements, can add to them, as a means to develop his chest by taking in the greatest possible amount of pure, fresh air. To this end, he takes exercise (H), which is accomplished in the following way: He takes the usual position of "attention," then inhales deeply, rolling the shoulders upward and backward, holding the air for four seconds, and, on the fifth second, exhales all he possibly can, assuming again the original position; but before again inhaling he makes a second expiratory effort, while turning his arms outward (movement of supination), and pressing the inner side of the upper arm against the chest; thus, so to speak, he squeezes out all the air there is left in the lungs. A vacuum or emptiness in the lungs is thus created, and the pupil involuntarily takes a very deep inhalation, after that assuming the ordinary quiet position of "attention."

To show the value of this exercise, let me repeat here that during ordinary inhalation and exhalation—that is to say, quiet respiration—the amount of tidal air inhaled is only 500 cubic centimeters, the volume which can be inhaled by the first exercise is 1,500 cubic centimeters, and the volume which can be exhaled by this exercise is about 1,300 cubic centimeters. When, now, by the second expiratory effort, aided by the supination of the arm and pressure against the chest, 500 cubic centimeters more of reserve or residual air can be expelled, the value of this exercise before going to work, at recess, and on return from work, or whenever one is environed with fresh, pure air, must be evident.

I hope what I have said in the foregoing may have helped to convince the pedagogues, the physicians, parents, and the general public what open-air schools, instruction in the open air, and breathing exercises could do for our children and what immeasurable benefit in sanitary, intellectual, moral, and even financial gain would accrue to the nation.

According to our Constitution every individual community has to take care of the education of its children, and the wealth, the number of children, and the density of population in general is unequally distributed. As a result many communities, poor in resources but rich in children, can not offer to their future generations the facilities for getting that mental, physical, and moral development to which they are entitled by reason of being the children of a great, free, and rich country.

What a field for doing good lies here before our wealthy, well-meaning fellow citizens. To help the poor communities to have ideal schools, with ideal open-air classes, to provide poor and undernourished children with nutritious food, to help the poor communities to attach to every one of these schools a physician and social worker, the latter to work with a view to aid the truly needy and to prevent pauperization, would bestow a blessing upon future generations the magnitude of which is beyond calculation.

According to the report of the Commissioner of Education, there are at this time about 20,000,000 children attending public schools in the United States. Placing the percentage of tuberculosis among them only as low as 3, would make 600,000 tuberculous children who are at this time in urgent need of open-air instruction. According to the above-mentioned statistics, we have provided at this time instruction in open-air classes for 1,755 tuberculous children. The anemic, the nervous, the children suffering from cardiac diseases, who are in equally great need of outdoor instruction, are not included in the 3 per cent.

Many of these children, who are not properly treated because of nonrecognition of their disease, or lack of facilities to treat and cure them, must die during school life, but not before they have cost the community and their parents thousands and thousands of dollars for education and maintenance. In a paper recently read before the New York Medical Society, entitled "Primary sources of tuberculous infection, their relation to eugenics, and the cost of tuberculosis,"[4] I estimated the average duration of the life of the 50,000 children who die annually from tuberculosis in the United States as about 7½ years, and, figuring the cost to parents and community, per life, at only $200 per annum, the financial loss thus represented is $75,000,000; and these children have died before they have been able to give any return to their parents and the community. What a useless sacrifice of life and of money. What a useless cause of sorrow and heartaches to parents. And all because we do not take care of the child at the right time, and do not educate it in the right place. How much there is to do, and how little is as yet done.

DISCUSSION.

Dr. Leo Burgerstein, Vienna Austria: In the United States, many plans have been tried for the establishment of open-air schools. In some instances, an entire floor has been converted into a single open-air schoolroom. Open schools are conducted throughout the year, the children in winter being provided with warm clothing, and adequate protection for the feet.

C. Ward Crampton, M. D., director of physical training, department of education, New York City: We are all in general accord with the increase of the number of out-of-door schools. The present necessity of providing for children living in increasingly congested localities prohibits the present general adoption of this excellent plan. In the great school building of to-day, with its 48 to 72 class-

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[1] Primary sources of tuberculous infection, their relation to eugenics and the cost of tuberculosis, New York Medical Journal, June 29, 1912.

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[3] Ayres, L. P.: Open-air schools; Doubleday, Page & Co., New York.

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rooms, we have adapted ourselves to conditions so abnormal that a "return to Nature" would be undesirable if it were not impossible. We may open the whole area of one side of the classroom, but this will not ventilate it. At times the exposure to wind and weather is dangerous to pupils and at other times the air is stagnant. This is not adequate ventilation. We must accept the situation and develop our system of mechanical ventilation till every child is bathed in air of the proper variations of temperature and humidity, air which is not only as good as the average that Nature provides, but as good or better than may be provided by natural means.

Dr. Maximillian P. E. Groszman, Plainfield, N. J.: Open-air schools will have an effect upon the rational development of the course of instruction in addition to its effect upon the general health of the pupils. They will assist in breaking down the traditional artificial standards. To tie the children down to desks in the old three R's system of reading, giving half the time to reading and the other half to writing, would be an abomination and an absurdity in an open-air school. Open-air instruction will give back to the child his birthright, viz, to develop through motor activity, through exercise, through doing, rather than through books and symbols.

Another thought suggested by Dr. Knopfs's remarks was that the "wealthy fellow citizens," who, he thought, could do so much to further these child-saving reforms, should be present at these meetings and listen so as to learn. But they are usually conspicuous by their absence.

SOME FUNDAMENTALS OF THE HYGIENE OF THE TEACHER.

Grace N. Kimball, M. D., Poughkeepsie, N. Y.

In presenting a paper on this subject to a scientific assembly it is proper that at the outset I should announce that in the limits necessary I can only bring to your attention some considerations that seem to me to underlie the well-being of the teacher. I can not adduce particulars or statistics to prove my theses. Moreover, and for the same reason, I shall consider the subject only as it refers to women as teachers.

In the course of rather extensive professional relations with large numbers of women in the teaching profession my observations confirm me in the opinion that the most prevalent physical disabilities among them are those that have a nervous origin. The various manifestations of neurasthenia, insomnia, gastrointestinal neurosis, pelvic disturbances (largely of nervous origin), neuralgia, neuritis, eye strain would probably constitute 75 per cent of the chronic disorders of the women in the profession. Uterine displacements complicate pelvic neurosis in a large number of cases.

These being the facts, any inquiry into the hygiene of the profession should look to the causes of this predominance of neurosis.

I. THE HYGIENIC VALUE OF THE SOCIAL ESTIMATE.

The quality of the service rendered to society by the teaching profession is a fundamental determining factor in human progress. The social estimate of the importance of this service underlies the elaboration of the profession in a very direct and basic way. In the first place, the higher the social estimate the greater the power given to local school boards and governing bodies. This means more of efficiency and less of politics in the selection of these bodies. It means higher ideals of service. It means that boards of education shall command more liberal financial provision for the work, thus insuring the perfection of equipment and the highest grade of instruction obtainable. In the second place, the higher social estimate has a direct and powerful influence upon the general efficiency of the teacher, and in particular upon the hygiene of the teacher. As the air which her professional being breathes must be the comprehension that her work is received and valued as essential to the well-being and elaboration of the individual and of society, in a degree not exceeded by that of any other profession or human influence. She will never be efficient in the highest degree, and rarely, in the long run, physically at her best, unless she withstands the enormous demands of the day's work by the sustaining sense of the value of the service she is rendering society. Society expresses this estimate by its established ideals, by its provision of material equipment, and by the scale of remuneration.

II. THE HYGIENIC VALUE OF HIGHER STANDARDS IN THE SELECTION OF TEACHERS.

The movement in many States toward a pedagogic standardization of the profession, comparable in some measure to that of the medical profession, demands greater elaboration. The large and rapidly increasing output of women's colleges provides society with a wider choice and a possibility of higher standards than the world has ever known. The first fundamental consideration as affecting both the efficiency and the hygiene of the teacher is personal fitness. This determines success in all professions. But in no profession is it more important for success and well-being than in that of pedagogy. Nor is any essential so impossible to standardize. And yet the ideal of personal fitness should be high; for we do easily what we do well, and we do well that for which by nature we are fitted. This is one of the fundamentals of the hygiene of the teacher. Hence, with the large and rapidly increasing number of college-bred women, the greatest discrimination should be exercised to select the naturally fit. The requisite education and financial need have been largely the determining factors of the past. An increasingly higher and more critical standard must prevail in the future. We may elaborate systems of hygiene and mechanical devices therefor, but, after all, there is no controlling factor so strong as the essential individual and her outlook on life and work.

Given, then, the sense of the social value and dignity of the profession, and the natural fitness for it, there is also the fundamental demand for a longer, more elaborate, and more deliberate preparation for teaching than our present economic conditions seem to permit. The standard that is being rapidly reached in divinity, medicine, and law will naturally be attained in pedagogy, namely, the liberal arts education, followed by a standardized professional training.

Assurance of adequate preparation gives a poise and ease of performance that has direct and pervasive hygienic values. An incalculable amount of physical damage is done in the teaching profession by the nervous reactions of physical unfitness and of hurried, crammed, and insufficient preparation. This is especially true of teachers in the lower grades, because of the common but fallacious belief that any person who has passed through the school grades demanded by the boards of education is thoroughly prepared to teach in the same grades. The unprepared and undeveloped mind reacts upon the body, and usually there is no one wise enough to detect the subtle morbid influence. When the path of knowledge runs too near the precipice of ignorance, the nervous tension is too great. A genius may say, " By dint of teaching the subject for many years, I finally arrived at some slight understanding of it." But a public-school teacher in the grades should have a clear and adequate knowledge not only of her subject but of correlated subjects before she begins to teach at all.

Again, higher physical standards in the selection of teachers are both necessary and possible.

The teaching profession is one which demands definite hours, consecutive days, exposure to the weather, considerable physical strain, and prolonged nerve tension. These conditions are not to any degree under the control of the individual teacher. Therefore there is the hygienic necessity for some standard of physical fitness that may be comparable to the standards established for officers in the Army and Navy. Physical training, athletics, and hygienic supervision, as now elaborated in the best of our colleges for women, make insistence upon physical and nerve strength possible.

In every community there should be a competent board of medical examiners, who should investigate with thoroughness and skill the physical fitness of every applicant for the position of teacher. Re-examination at suitable intervals should be made to insure the maintenance of proper standards, with especial attention to the detection of and elimination of tuberculosis. Moreover, there should be a great awakening of conscience on the part of the ordinary medical practitioner in relation to the exclusion from the school of teachers suffering from communicable diseases, and especially from tuberculosis.

III. THE HYGIENIC VALUE OF PROVISION FOR THE TEACHER'S WELFARE IN SCHOOL CONSTRUCTION, EQUIPMENT, AND ADMINISTRATION.

Given the hygienic importance to the individual teacher of assured dignity and social value of her vocation, personal genius for it, and a higher standard of selection, we come to the need of more definite and liberal provision for the teacher's convenience, comfort, and efficiency in the construction and equipment of our schools. The school is the teacher's office, study, place of business—not a mere workshop. I submit that in the vast majority of even our modern schools attention is almost entirely given to arrangements for the convenience and welfare of the pupil—very little to the legitimate demands of the teacher.

Since the larger part of the working day is spent in the quarters provided for her by the school authorities, the teacher's conservation of energy, her effectiveness, her protection against physical damage, depend largely on the degree in which she has been considered in the construction and equipment of the school. The convenience, comfort, beauty, and even luxury of the modern business office are an acknowledgment of the sentiment that the place in which one works must conduce to one's doing one's work well. The growth of the same sentiment in regard to the construction and equipment of schools will equally conduce to the well-being and efficinecy of the teacher, and can be made—should be made—to conserve her energy, give working facility, affort aesthetic satisfaction and a sense of official dignity, and thus contribute to the hygienic maximum.

Under present conditions the teacher has no private officé, no study in the school where she does the large amount extra-sessional work of preparation and of inspection of pupil's work that form a part of her duty. It is the exceptional teacher who has in her home a proper and comfortable study. Her dignity of office demands at the hands of the community a suitable place in which to work. The bedroom or the family sitting room are unsuitable; neither is the common schoolroom suitable. After the pupils are dismissed the remaining work of the day should be completed in an environment of privacy and comfort, conducive to physical rest and mental satisfaction. This work is in the vast majority of cases at present carried home to be done in the confusion of domestic surroundings or in a cold and cheerless bedroom. The teacher's work should be done in her office, and left there.

Even with our greatly improved schoolroom arrangements, there still remain other evils arising from the custom of considering only the pupil. More attention should be given, for instance, to grouping the pupils so that the teacher may obtain the best possible command of her school audience, and that, too, without the necessity of constant standing. The physical tax of prolonged standing, under all physiological conditions, is a waste of energy—mental as well as physical. Again, the arrangement of lights in the schoolroom must give equal accommodation to both teacher and pupil. In brief, all the details of construction and arrangement should be scientifically considered in the interests of the teacher, in order to be in the highest interests of the pupil.

In matters relating to the administration of the school, the hygienic efficiency of the teacher may be greatly advanced. Spontaneity, enthusiasm, reserve force, quiet nerves are essential assets of the successful teacher. These pedagogic forces are weakened or withdrawn in proportion as the individual is surcharged with the toxins of fatigue. Prolonged periods of classroom work, especially in lower grades and in large classes, bring about rapidly such toxaemia, with its inevitable physical lassitude and nervous irritability. An important provision in the day's program is that of insuring a sufficient number of short intervals of relaxation to allow for the elimination of fatigue toxins. This might involve the employment of proctors who should visit each schoolroom in turn and provide both relief to the teacher and relaxation to the pupils equally in need of it.

The pressure which is continually felt toward overcrowding our schools should be more and more vigorously met by a counterpressure tending to reduce the number of pupils allotted to each teacher. The hygienic ratio between output and intake of personal force should be scientifically adjusted. The dilution of personality is at present too great—an irreparable loss to the pupil and a stultification to the teacher. Extra-sessional work to some degree counteracts this dilution, but the advantage comes to those least responsive to it—the dullards and the miscreants. And it is more than questionable whether the cost is not too great to the teacher. The removal from the mass of pupils of the backward and deficient children will have important hygienic value to the ordinary teacher.

The ever-increasing demands made upon teachers for clerical work, as well as the development in our schools of social work, may again suggest the employment of more teachers in proportion to the school population to guard against the overwork and confusion of mental processes entailed. Nothing could be more inimical to mental spontaneity or more productive of toxic fatigue than long hours spent in correcting papers, making up averages and statistical reports. Much of this work could be profitably delegated to nonprofessional employees, and the inestimably valuable public asset of mental vigor and nerve poise of the teacher be conserved for the development of her higher functions.

Participation in the social work of the school—mothers' meetings, house visitings, and personal relations with the pupils—should also be met with a corresponding reduction in the amount of actual teaching required and in the number of pupils dealt with by each teacher.

The hygienic conservation of the teacher depends to a certain extent on the supply system. The system should be elaborated, so that teachers may not be obliged to be on duty at times and under circumstances when they can neither conserve their own health nor render adequate service in their classes. With higher standards, as suggested, the average teacher should be able to teach through the entire month, but occasional exceptions to this rule, otherwise well fitted, and exceptional occasions in the usually normal individual will occur. Many transient indispositions render this supply system doubly valuable when we consider that the colds, influenzas, throat affections, etc., which constitute the majority of their indispositions, are usually of an infectious character and should be excluded from the school in the interests of the pupil. The teacher suffering from coryza, tonsilitis, pharyngitis, and influenza should be expected to absent herself from school, not as a privilege, but as a duty, without financial loss.

IV. THE HYGIENIC INFLUENCE OF THE PRIVATE LIFE OF THE TEACHER.

The position of women in extra-domiciliary industry is a new one. The process of adaptation to this new position is still going on and has not kept pace with the demands for such service.

The man goes to his employment, receives his compensation, provides for his daily necessities, buys his clothing, and grants himself such physical comforts and recreations as he considers his due. He does not know how to cook his own food, to set his own house in order, to do his own washing and mending, or to make his own clothes. He knows how to earn the money by which he may have these things done for him; in reality, they are often done largely by unpaid labor. And society recognizes the imperative necessity that the man's earning power should be adequate for the purchase of this service. He has neither time, strength, nor inclination to perform these for himself.

Not so the woman wage earner. She knows how to do all these things. For untold generations it has been her work to do them. Her atavistic tendency is to do them still. Moreover, her compensation, with its sex discrimination, is usually inadequate for the procuring from others of this service; and while having no more time and certainly no more strength than the man, she has the feminine sense of obligation toward these tasks, and she does them, often not only for herself, but for others dependent on her. Household opinion, still in the early stages of adjustment to woman's new economic condition, easily allows, if it does not actually demand, the double service at the woman's hands. The comfortable personal indulgences that the man looks forward to after his day's work have no counterpart for her. The equivalent for the after-dinner pipe has not yet been evolved.

Women must learn the masculine art of relaxation before they can reach hygienic safety. And they must reach hygienic safety and sanity in order to attain the highest executive efficiency.

The woman teacher, then, to achieve the truest efficiency must eliminate from her category of duty personal and household obligations, and activities that deprive her of the rest and recreation necessary to that efficiency. She must realize that her powers are sacred to her calling. This she can not do until the public realizes that the remuneration of the teacher is a strong factor in assuring her hygienic and pedagogic efficiency. In order to bring this about, the public must be educated to appreciate the fundamental value of the teacher's service to society and the individual, and to be willing to express this estimate in dollars and cents. Appreciation of the worth and dignity of the teaching profession, if it were expressed in money values more liberally, would not only have its absolutely direct effect upon the hygiene of the teacher, but would also give a moral elevation of great pedagogic value.

Moreover, if this were the estimate of the general public, maintained in public schools, the owners of private schools would no longer be able to unduly increase their profits at the expense of the teacher, as is now done in the large proportion of girls' schools. There are notable and noble exceptions.

Again, there is a definite hygiene bearing of sex discrimination in the salaries of teachers. A given position should command a uniform remuneration irrespective of the sex of the teacher. Injustice has distinct hygienic effects. And the teacher who has assurance of her ability, by virtue of her appointment, but nevertheless because of the accident of sex, bears the indignity of smaller pay, will inevitably harbor an enemy at the core of her self-respect and sense of justice which will have its physical effect. This is not a question of whether her lower salary is sufficient for her maintenance; it is a question of common justice and a *quid pro quo*. Moreover, it is my belief and experience that quite as many women as men in the teaching profession have others dependent upon them for support.

While an equalization of remuneration would unquestionably be a fundamental condition of improved hygiene, both by its moral effect and by its easement of physical conditions for our women teachers, it would be open to the economic danger of displacing women from the profession and attracting more men to it. But experience shows that women will always predominate in pedagogy, by virtue of the inherent maternal instinct with all the peculiar traits of character and adaptations of temperament that the instinct carries with it. And society will inevitably more and more benefit by this extension of the maternal function to the children of the state. When we truly realize the paramount value of this extension of the maternal function, and when the teaching profession receives the crown of true valuation and dignity, the hygiene as well as the consequent efficiency of the teacher will have passed to new altitudes.

DISINFECTION OF NOSE AND POSTERIOR NARES.

JOHN J. CRONIN, A. B., M. D., Department of Health, New York City.

For the past 18 months I have been paying attention to a subject that I think is worth while.

In the matter of the port of ingress of germs of disease there is so much written that often I have been struck with the notion that where so many explanations are necessary there is no real knowledge.

When the mouth and the nose are considered side by side, there are certain striking facts brought to the surface. Considering these facts, with the knowledge we have of the conditions necessary for the growth of germs, I think it may be reasonably certain and to the point to make certain deductions.

Generally speaking, each specific germ requires a specific medium in which it will grow. The conditions of this medium must be heat, moisture, reaction, and pabulum, and a reasonable degree of quiet. Given a clean mouth, these conditions do not prevail. Therefore, it may be concluded that germ development does not prevail in a clean mouth. By mouth I mean buccal surfaces, gums, teeth, and anterior surfaces of the anterior pillars, soft palate, and uvula.

The tonsils may be considered *pari passu* with the mouth, and further, the fact that the tonsils have no direct lymphatic drainage render them, as primary foci, highly improbable.

If we further consider that the mouth is in a state of constant mobility, the mouth as a primary focus of disease is still more an improbable focus of disease ingress.

What an unclean mouth does may easily be conjectured. An unclean mouth is always associated with hypersecretion of saliva, which is usually swallowed. Saliva will interfere with perfect digestion, and, with a condition of salivation, the chances are that the amount of saliva in the stomach is more than the permissible minimum.

As a direct sequence, therefore, the body nutrition is interfered with, resistance lowered, and the presence of germs usually means the onset of disease if the person is otherwise susceptible.

Consider further the fact that, after all, very few people breathe through their mouth when they are in places of exposure.

It seems scarcely possible that any germ life can exist after digestion. Therefore, if the place, media, conditions, and probability of the presence of germs may be considered reasonably wanting, that place may legitimately be discarded as an important portal of invasion for specific germs.

On the contrary, with the nose and posterior nares, the very factors that render it improbable that the mouth is an imporant portal of invasion of contagious diseases are here so classically present that the conclusion must be sustained that the nose and pharynx are the most important, and, probably, the only place conducive to the growth and development of disease germs and their invasion, to cause systematic infection.

THE ANATOMY OF THE NOSE.

The anatomy of the nose gives the most direct suggestion; that is, the most important portal of ingress of disease-producing germs. The nose, made up as it is of 14 bones of peculiar spongy type, covered by a very sensitive mucous membrane, lining the numerous fossæ and each fossa contiguous to important organs and supplied with abundant nerves, common and specialized; supplied with plexus of veins and arteries and finally supplied with the richest and most delicate lymphatic system, would seem to have been so constructed that it would be the special spot by which infection must enter the general constitution.

PRODROMATA OF CONTAGIOUS DISEASES.

If analysis of the prodromal symptoms of each and every contagious disease is made, it is noted that all prodromal symptoms are presented in the nose, eyes, and pharynx.

As exemplifying the favorableness of the nose as the essential focus of contagious disease, probably more objectively than any other, measles may be chosen.

Recently it has been established that before the onset of measles inspection of the buccal mucous membrane reveals certain pearly spots. These spots are located about the area of well-known lymphatic vessels. It is a well-known therapeutic fact that heat and moisture will determine the onset of the cutaneous measle rash, but the general cutaneous eruption does not obtain until the body is sufficiently charged with toxic products and the emunctories are overworked and local irritations set up in the skin.

It is a well-known fact that the primary site of any infection shows the characteristic of the disease some time before the other areas of the body. So in measles the nose, posterior nares, and mouth provide all the elements for development of local manifestation of measles and show the evidences of the disease at a time when the general cutaneous surface is not involved.

It is also well known that the lymphatics draining the primary site of infection are the first to become swollen and tender. In all contagious diseases the lymph nodes of the anterior cervical region are the ones first involved.

The conditions of environment are such that the specific diseases producing germs are distributed so freely and liberally that it would be rare indeed if the specific organism of any contagious disease may not be recovered from a culture taken from the posterior nares. The meteorological conditions are such that local congestions and injuries of the nasal mucous membrane are produced readily and repeatedly. There is no other mucous membrance that is subject immediately to the effects of meteorological conditions, and there is no other mucous membrane that so passively accepts, receives, and retains offense as the nasal mucous membrane and its contiguous parts. There is no cavity of the body where dirt is allowed to remain without the application of cleansing fluid as the nose, except it may be the external auditory canal. The amount of labor necessary to cleanse the nasal cavity is too great for the efforts of the ciliated epithelium, especially so in cities.

There is no organ of the body about which there is so much ignorance and to which less educative endeavor is applied to overcome this ignorance than the nose. During certain seasons of the year disinfection of the nasal cavities and posterior nares and pharynx is mandatory. At all seasons of the year it is a very cleanly habit to irrigate these chambers to rid the parts of incrusted débris and allow proper functions to operate.

Disinfection of the nares and pharynx is best operated by the following means: A 2-quart container, to which rubber tubing of proper length is attached, is filled with warm water, and two teaspoonfuls of salt is dissolved in the water. The container is hung about 4 feet above the head, so that the water runs into the nose under a 4-foot high pressure. One end of the rubber hose is put in either nostril and the water allowed to flow in one nostril and out the other. The usual precautions against blowing the nose must be observed.

During seasons of the year when contagious diseases are prevalent, instead of salt, the liquor antiseptic (U. S. P.) should be used.

Needless to say the operation should not be attempted except after demonstration and advice of a physician.

School nurses should be thoroughly drilled in the modus operandi, and all school children showing nasal secretion, congested eyes, or blocked nose should be referred to the school nurse, who will apply the remedy and continue its use in the school.

All children of a class where contagious disease has been should be treated by this means at least once a day until the period of incubation is over.

Instructions in nasal hygiene should be given to the children in the homes where contagious diseases exist by the visiting nurses, that the other children may avoid the danger of contracting the disease.

While enough practical evidence has come under my own observation to warrant the belief that contagious diseases may be limited by this procedure, and while the theoretic deduction seems sensible and sound, no application of this procedure has been tried on a large scale.

The school children of any large city provide plenty of material, and inasmuch as no harm can be done if no real results are obtained, it seems therefore befitting that a trial of the scheme should be had for the possible great good that may ensue.

DISCUSSION.

C. Ward Crampton, M. D., Director of Physical Training, Department of Education, New York City: I wish to correct certain errors of the preceding speakers. The board of education (not the board of health) in the city of New York has in its employ two physicians, who give a thorough medical examination to all applicants for teaching positions. This has been the practice for over 12 years.

Moreover, all applicants for admission to the city's training schools must pass similar examinations two years before they apply for license to teach.

Furthermore, all applicants for admission to training schools must, upon application, furnish a record of physical examinations made during their high-school course. This record contains a notation of all diseases and defects, with the steps taken to remedy them, with evidence that the applicant has or has not been able to engage in the vigorous gymnastic work required in the high schools.

Before licensing a candidate we have at hand the record of six years of observation and hygienic care, and, in addition, give the routine physical examination.

ON THE OCCURRENCE OF SYPHILIS AND GONORRHEA IN CHILDREN BY DIRECT INFECTION.

Abraham L. Wolbarst, M. D., New York.

The subject of this paper, though it applies directly to children, has a distinct and immediate bearing on the men and women of the future, for the diseases we are about to consider do not leave their young victims without a lasting heritage.

Of the two diseases we are about to deal with, as affecting childhood, syphilis is the only one which may be transmitted to the child, *in utero*, as a constitutional taint. The manifestations of hereditary syphilis are known to all, and do not concern us at the present moment. We shall devote ourselves exclusively to the study of these diseases as acquired by direct infection. By direct infection I mean the infection of a child, born healthy, with the active principle of the disease, either through negligence or with vicious intent.

Gonorrhea is the more common of the two diseases, both in the adult and in the child. This disease may attack an infant at birth or immediately thereafter, usually selecting the mucous membrane of the eye as its nidus. The infection is carried to the infant while it is passing through the vaginal canal of the mother, which has previously been the seat of the disease. As the infant passes through the parturient canal, pressing with its head against the walls and putting them on the stretch, the vaginal secretion containing the infectious gonococci, among its other bacterial flora, is squeezed into the infant's eyes and there sets up an acute inflammation. Any mucous surface may be attacked; and there are not a few cases on record in which the genitals of female children were involved, with the production of a typical vulvo-vaginitis.

During the past decade much has been said concerning the occurrence of gonococcus ophthalmia in the infant, with its attendant blindness. Let us give this subject a moment's consideration, in view of its well-nigh unbelievable frequency and its terrible consequences. From the standpoint of child hygiene, opthalmia neonaorum of gonorrheal origin is perhaps the most important single factor we have to deal with. First, because of its great frequency—it is said to occur in about 1 in 200 of all births, rich as well as poor; second, because it is the most common cause of blindness: Fully 25 per cent of all the cases of blindness in the world to-day are said by responsible authorities to be due solely to gonococcus ophthalmia; thirdly, because it is largely preventable, and usually curable, if proper measures are adopted in time to avoid permanent damage.

In his classic work on this subject[1] Stevenson showed that about two-thirds of all cases of ophthalmia in the newly born are due to the gonococcus. In the United States alone, according to the last census, there are fully 7,000 men and women who owe their blindness entirely to this disease.

The exact time of inoculation of the infant's eyes with the infectious maternal secretion is not known, but it may occur at any moment after the rupture of the enveloping membranes. In a few cases the inflammation is well advanced at birth, but it usually does not make its presence known until 12 to 48 hours after birth. Cases are recorded in which the children were born with well-advanced destruction of the cornea of both eyes, and Phillips[2] mentions an extraordinary case in which the eyes were found infected and filled with pus when taking the child from the abdominal wound after Cesarean section. It is not stated whether or not gonococci were found in this pus.

Bathing the infant soon after birth has been the means of transferring the infection to the eyes. Unless extreme care is employed, the infectious vaginal secretion adhering to the skin of the infant's body may be washed into the eyes, thus producing the inflammation. Such a bath surely merits the term "*Giftwasser*," applied to it by Schirmer.

In all the mass of evidence as to the awful nature of this infection, the important thing for us to remember is that much, if not all, of this blindness and consequent misery can be prevented. Prophylactic measures were first suggested by Crédé, of Leipsic, in 1882. During the three decades that have passed, eyes innumerable have been saved from perpetual darkness by this method of prophylaxis. Its value may be judged by the statistics offered by Kösling. In 17,000 cases of childbirth, in which preventive measures were not used, 9.2 per cent of cases of ophthalmia neonatorum developed; on the other hand, in 24,000 cases, in which the Crédé method was employed, the percentage of cases of ophthalmia was reduced to 0.65 per cent; surely a convincing argument in favor of the method. Nevertheless, in spite of the teachings of bitter experience, there are still 25 per cent of our blind who have been permitted to become so through carelessness or negligence.

Here, then, lies a great field of endeavor for the humanitarian—the abolition of blindness through the universal adoption, by law or by custom, of the Crédé method of prophylaxis.

Next in importance, though greater in frequency, is the occurrence of gonococcus infection of the genitals in children. It is far more common in girls than in boys, and for obvious reasons. The anatomic arrangement of the female genitals, especially in childhood, presents a soil that is highly favorable to infection from without, and this alone would appear to account for the greater frequency of the infection in girls than in boys. Another plausible reason is perhaps found in the fact that the tendency for adult males to tamper sexually with female children is greater than for women to have relations with male children; hence the greater risk of infection. In female children, infection spreads rapidly from adult to child, or child to child, by the mere handling of toys, wash cloths, towels, urinals, etc. Anything, in fact, that comes in contact with the child's genitals may carry the infection.

It should be borne in mind, however, that every case of vaginitis or vulvovaginitis is not necessarily caused by the gonococcus, but it should be looked upon with suspicion and the diagnosis positively made; for even though the gonococcus may not be detected in the early stages of the infection, the purulent discharge increases and the specific bacteria appear after several days.

This disease is not limited to the children of the poor, though filth and congestion are favorable factors in its causation; it may be found among the well-to-do as well, in boarding schools, and in private homes. In these instances the infection may be brought into the home by maids and nurses or playmates. R. E. Kimball, speaking of this feature of the disease, states that one of the worst cases of gonorrhea he ever saw was in a child 8 years of age, and was acquired in a fashionable school in New York.

Among the poor, where crowding and congestion and lack of privacy are synonymous terms, the disease is almost endemic. Stella,[3] refers to the occurrence of gonorrhea among the little children of the Italian population of New York and laments "the hundreds of young girls of 5 and 10 reeking with pollution accidentally communicated to them through bedding and towels and lack of sanitary conveniences in overcrowded tenements;" and Charles H. May wonders that gonococcus infection of the eye is not more frequent, in view of the frequency and persistence of these genital affections in female children. It is quite likely that eye infection is rather unusual in these cases, owing to the fact that the virus reaches the eye in a somewhat attenuated form.

Children who sleep in the same bed with the mother are frequently the victims of infection. Here we have a link in a vicious chain, which deserves our most serious consideration. The immigrant reaches this country alone, as a rule, leaving his wife and children in Europe until such a day as he shall have established himself firmly in his new home. In the meantime, likely as not, he is infected with gonorrhea; and when his family arrives to share his prosperity, his faithful wife is made to pay the penalty in the form of a gonococcus infection from which she rarely recovers entirely, and which she often transmits innocently to her children. In a study of this subject made in one of the largest hospitals in this city I was enabled to show[4] that about one-third of 1 per cent of all the male immigrants who applied for treatment in its dispensary were suffering from venereal disease, mostly gonorrhea, acquired during the absence of the wife. Ultimately the wife and children are infected, and thus the endless chain progresses.

In institutions and asylums the gonoccocus infection has often run riot and assumed terrible proportions. Not alone the genitals, but other parts of the body, are affected. Kaumheimer[5] has dwelt on the occurrence of rectal gonorrhea in young girls, the result of contagion by direct infection from the vaginal discharge. The symptoms of this condition are often so slight that it passes unnoticed, but he expresses the opinion that this may be the means whereby the infection spreads so rapidly and insidiously in hospitals, institutions, and asylums where many children are congregated. He also wisely suggests that, on this account, the temperature of a child suffering from genital gonorrhea should never be taken *per rectum.* His data have received full corroboration through the earlier observations of Flügel,[6] who found the rectum involved in 11 of 56 cases of vulvovaginitis, or 20 per cent. In adults the proportion is greater—about 30 per cent.

These children are also apt to be crippled for life, when arthritis supervenes as a complication of the vulvovaginitis. In 1905, Holt found 26 cases of gonorrheal arthritis, single and multiple, in the Babies' Hospital, New York, in a period of 11 years. He states, in this connection, that "a pyemic arthritis in a young infant, I believe, is much more frequently due to the gonococcus than to the streptococcus or any other pyogenic organism."

Nor is this the most serious complication to which these little victims are endangered. Inguinal adenitis and abscess formation are not unusual; less common, fortunately, is the occurrence of an infection of the peritoneum, local or general, with the grave possibility of a fatal termination. Sterility in after life may also follow the infection, particularly if the uterus and the tubes have been involved.

Lastly, I wish to mention a source of infection in young girls which is of considerable sociologic importance. I refer to that form which follows sexual contact with adult or youthful males. This phase of the subject has been carefully studied by Pollack, of Baltimore, with startling results. She reports 184 cases of gonorrhea in young girls varying in age between 1 and 15 years. She estimates that there must be from 800 to 1,000 such cases each year in the city of Baltimore, these figures being considered a conservative estimate. She believes the cause of most of these outrages upon children to be due to the superstition among many people that a person suffering with gonorrhea or syphilis may get rid of the disease by infecting another person of the opposite sex, preferably "an untouched virgin." Thus a defenseless child is the most natural victim. She does not agree with the oft-expressed view that these attacks are the result of sexual perversion. In her cases nearly one-third of the victims were between 3 and 6 years of age. This superstition is quite prevalent in many European countries and among the southern negroes, and is alluded to in the works of Havelock Ellis and Kraft-Ebing as a prolific cause of sexual attacks on young children.

The reported experience of W. T. Gibb, physician to the Children's Society of New York, is of interest in this connection. In 15 years he examined over 800 girls, ranging from 8 months to 16 years of age, on whom rape and other crimes had been committed. Almost 13 per cent of all the children examined suffered from venereal disease—10 per cent had gonorrhea, 2½ per cent had chancroids, and the remainder had syphilis. The rarity of syphilis was probably due to the examination having been made but a short time after the commission of the crime, when the time elapsed had been too short for the characteristic symptoms of the disease to appear. He believes that the number of cases seen by him is but a small proportion of the actual number of such crimes, as the great majority of children never tell what has happened to them.

In boys gonorrheal infection is far less common than in girls. Infection spreads with less facility, owing to the anatomic reasons above mentioned, but once the infection has been established, the victims are subject to all the dangers and complications that have been previously discussed. It has been my privilege to study 41 cases of gonococcus infection, in boys ranging in age between 18 months and 14 years, as follows: Two years or under, 5 cases; 4 to 7 years, 17 cases; 8 to 10 years, 4 cases; 11 to 14 years, 15 cases. The largest percentage is found among boys between 4 and 7 years, and those between 11 and 14 years. The former age is the more favorable for the practice of the superstition already mentioned, and the latter includes the boys who are old enough to have learned the possibilities of the sexual function and the means of its gratification. In one of my cases the victim was a boy of 4, who was "assaulted" by a precocious girl of 12, who was found to have attacked and infected many young boys of the neighborhood; she had previously been infected by a youth of 20. A somewhat similar case is mentioned by Wilson.[7] A boy, aged 9, was infected with gonorrhea by a girl, aged 12. On examination, the girl was found to have gonorrhea. The infection seemed to be prevalent among the younger children in the neighborhood, and further investigation revealed, as its source, a woman of public affection and of nymphomaniacal tendency.

Still more serious, in my opinion, because far less excusable, are the cases of young boys, infected with gonorrhea in public hospitals, through the use of unclean catheters. I have seen 11 such cases. These children were sent to the hospitals for various diseases of childhood, and in the course of their illness it was necessary to empty the bladder with a catheter. In this manner, gonococcus infection was carried to these innocent children, with dire results. This is nothing short of a criminal act, which ought to be unheard of in a civilized community. This form of infection can be done away with by the simple expedient of using a new catheter for each new patient. The Supreme Court of Washington (Helland *v.* Bridenstine) recently decided that damages may be recovered for alleged malpractice, consisting of the use, in and on the plaintiff, of unclean and unsterilized instruments, whereby the disease of gonorrhea was communicated to the plaintiff. This leads me to wonder whether these victims by catheter infection in hospitals could not also recover under this ruling of the court.

In boys the disease is apt to run a more virulent course than in girls. Arthritis is more common, as is shown by the figures of Holt, above quoted. Of the 26 cases of gonorrheal arthritis 19 were in boys and 7 in girls; most of the cases reported by Kimball were also found in boys.

Coming now to the subject of acquired syphilis in children, it is apparent that this form of the disease is quite unusual, though not rare. It is not so readily transmitted as gonorrhea, and those who suffer from it are not always in the infectious stage. Pollack, in the paper referred to, saw 36 cases in girls with the double infection of gonorrhea and syphilis. Seven were in the primary stage and 29 in the secondary. Stella, also quoted above, tells of "the many mothers of the poor, who take children from institutions to nurse them, and who have been inoculated with the poison of syphilis;" and he further mentions a case, in his own experience, where the infection was not recognized on account of its extra-genital origin, and was communicated by the mother to four of her children, her husband, and a sister.

Some years ago I saw a frail little Polish immigrant boy, not more than 2 years old, with a primary lesion on the lower abdominal wall; secondary symptoms which were present made the diagnosis unmistakable. It has also been my fortune to see recently a little boy of 5 who had a typical genital chancre, with extensive secondary symptoms. How these children are thus infected it is difficult to say, but surely there must be some way of saving them.

To recapitulate: Children are frequently the victims of gonorrhea and (less often) syphilis; girls are more often infected than boys; the infection spreads with great rapidity, and assumes a terrible virulence when introduced into hospitals, asylums, and schools; girls are often the victims of perverts and superstitious immigrants trying to rid themselves of their own disease; complications sometimes follow, which are far more serious than the original disease, among these being blindness, arthritis, proctitis, adenitis, peritonitis, and sterility in later life; congestion, crowding, and lack of privacy lead to precocious sexual knowledge and facilitate the spread of infection; the male immigrant is a frequent agent in carrying infection to his wife and children; children are often infected in hospitals through unclean catheters; they are subject to all the dangers and complications of the adult; both sexes are equally liable to infection with syphilis, but it seems to be more frequent in male children; lastly, the combined effort of intelligent men and women having the welfare of childhood at heart is needed to combat the unfortunate conditions that make these diseases possible; suitable prophylaxis and attention to hygienic principles can minimize to a marked degree the disastrous effects of syphilis and gonorrhea in children.

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[1] Ophthalmia Neonatorum, Its Etiology and Prevention, Trans. Obstet. Society of London, 1905, xlv.

[2] N. Y. Med. Jour., July 23, 1912.

[3] Med. Rec., May 2, 1908.

[4] N. Y. Med. Jour., Oct. 16, 1909.

[5] Münch. med. Wochen., May 3, 1910.

[6] Berl. klin. Wochen., Mar. 20, 1905.

[7] Buffalo Medical Journal.

SEX INSTRUCTION AND HYGIENE OF BOYHOOD.

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You and I, and indeed every person, must in some way or other come more or less in contact with boys, and we are, most of us, for one reason or another, more or less interested in boys. We therefore wish for our own sake, or for the boys' sake, to understand them.

The boy, if he grows to be a man, will do so because of the working within him of that force which we call life, influenced by a special fluid, manufactured in his body, which distinguishes him as male. Therefore we should understand the sex nature and development of the boy and his proper sex education and care.

Primitive people paid considerable attention to fundamental sex matters, and sex instruction occupied an important place in their education of boys. The American Indian taught his boy from infancy up, openly and honestly, the mysteries of nature and trained him in self-control and right living. The Indians were in consequence a people remarkable for their physical strength and endurance. In the white races modern civilization has developed the wonderfully inventive brain. But with this change from the physical to the mental there has come a degeneracy which is noticeable in a large proportion of the people, marked by lack of health, strength, and poise, and caused by, among other things, a bad sex life. This condition is attracting the attention of the physician, the educator, and many thoughtful parents, forcing upon us the necessity of arranging a better mode of life, based upon right principles, especially in regard to sex, because of its fundamental importance. To do this, the facts must first be known—what is wrong and what is right—and then we must teach the truth and train the young right.

As my work has for a number of years past been especially with boys, I shall, in here discussing the important subject of sex, attempt only to make a contribution concerning sex matters in relation to boyhood—males under the age of 20. The material upon which this study is based is from three sources: (1) Personal experience with a large number of boys of all classes and from widely different places (foreign born living in New York City, and poor, middle, and well-to-do classes native in New York City, and boys from city, town, and country from many sections of the United States); (2) the statements made to me personally and by letter by many medical men; and (3) two intensive questionnaires I have recently conducted. Where I give figures they will be in percentages deduced from these two questionnaires.

This study will be taken up along three lines:

1. Conditions that exist.
2. What can be done to teach boys the important truth.
3. A consideration of the training of boys in right living.

The medical man can of course study sex matters without embarrassment. In studying boys we can not think of any part of them as naturally unclean, and in talking with boys we therefore need have no feeling of embarrassment, for they are young and natural, and will quickly respond to our attitude. This is my experience. But in talking with older people I sometimes find it different, because some people either can not or have not learned to look at sex except as something peculiar. Although this paper will come before many who are not physicians, I shall hope that all can study with me without embarrassment a subject that is interesting, important, and should be clean, and I shall speak without reserve.

CONDITIONS THAT EXIST.

To many who are acquainted with the conditions, the setting forth of them here may seem unnecessary and even a pity; but as many others who are interested in boys and should know are not aware of the facts, I feel that the facts should be presented.

One of the first things the young man hears when going into physical training for athletics is that he should give up bad sex habits. The boy will hear it sooner or later. It is generally recognized among young men and boys that most of them have bad habits. Very often such habits are boasted of. It is usually thought that such habits show strength, but it is not usually claimed that they give strength. Young men and boys, though they so often abuse their strength and health by bad sex habits, nevertheless feel that both sexual indulgence and masturbation are detrimental to athletic prowess. Athletic trainers of young men—the majority of them—and physicians who see much of young men speak of the great prevalence of bad sex habits among young men and boys, and state their belief that continence is not only compatible with health, but conducive to the best health and strength. When using the term "continence" I shall always mean abstinence from sexual excitement—both sexual intercourse and self-abuse, or masturbation. My statistics show the following:

Frequency of masturbation.

Age of commencing.	Per cent.
Under the age of 10	2
10 (quite a number commence at 10)	7
11	3
12 (many commence at 12)	13
25 per cent commence under 13 years of age.	
13	8
14 (greatest number commence at 14)	21
54 per cent commence under 15 years of age.	
15	12
16	6
17	5
18	4
19	1
After the age of 20	1
Uncertain as to age (would probably be distributed between different ages)	7
Total number admitting masturbation	90

This table shows that nearly 90 per cent commit self-abuse before the age of 20. Other figures I obtained some years ago gave me a slightly higher percentage. The above table is made up of statements of young men between the ages of 20 and 30. It is fair to conclude that the figures are conservative, as (if any did not answer truthfully) probably not so many admitted masturbation as denied it. I do not believe there is much difference between the so-called better class of boys and boys of the poorer class in the percentage of those who masturbate.

I have also obtained the opinions of many physicians on this subject, and their opinions vary but slightly, some of them saying that they think 10 per cent would be a liberal estimate of the proportion of boys reaching the age of 20 without ever having masturbated, others placing the percentage still lower, and some saying that they believe 0 per cent, or practically that, would be the truth.

My statistics show the following as to—

Causes of masturbation.

Influence.	Per cent.
Older boy or boys (under 20 years)	27
Boy or boys of same age	17
Spontaneous (self-taught)	24
Men over age of 20	5
Bad associates (no age or sex given)	4

Influence.	Per cent.
Older girls or women	3
Miscellaneous	3
Licentious books	1
Physical causes: Morning need to urinate, irritation of penis, poison ivy and consequent irritation, riding horseback, sliding down a pole	6
Total number admitting masturbation	90

EFFECTS OF MASTURBATION.

Concerning the actual effects of masturbation, it is very important to know the truth.

Evidently most boys do masturbate more or less. It is not only the depraved, as some good people may believe. Moreover, the temptation is normal. We should feel sorry for the boy who has not growing strong within him these impulses which denote developing manhood. But the question as to whether or not an impulse should be gratified is another thing. Most growing boys are from time to time impelled to wild acts of many different kinds. At some time it may be the crazy desire to knock over everybody they meet. It is nevertheless not best for the boy to give way to the impulse, and he gradually learns to control himself.

There is no doubt of the ill effect upon boys of much masturbation—ill effects that are physical, mental, and moral. I shall not here rehearse the details. The ill effects may be briefly stated as largely due to undue excitement of a part of the body that has a determining influence upon the whole of the body and loss of an important fluid from the body—a fluid that should be reabsorbed by the blood from its place of manufacture and give strength and energy to all parts of the body. If the boy or young man is harmed in this way, his whole vitality is lowered, and he will more readily contract disease of different kinds, or he may simply drop off in health. He is himself usually more or less aware of what is going on. He needs help. He should have had the help years ago that he might have been fortified. But do not make the mistake of frightening a boy when in this condition. Some of the worst effects I have seen from self-abuse have been due to fright and worry. The boy who gives way to masturbation is truly to be pitied. But we need not fear for the boy who strives against it and is moderately successful. The ill effects of occasional masturbation have been very much exaggerated, whereas they are slight, if any. I hope I shall not be misunderstood, for I believe we should aim at perfect self-control.

The question has often been asked as to whether circumcision will tend to keep a boy from masturbation. In my series of cases, 7 per cent had been circumcised, with the following result:

EFFECT OF CIRCUMCISION.

Two per cent circumcised say they did not masturbate.

Five per cent circumcised say they masturbated, nevertheless.

To look further into the matter, we may group these cases as follows:

Some operated on in childhood nevertheless later commenced to masturbate.

Some who had commenced masturbating were operated upon, but continued masturbating.

My general experience, before I began to record the cases, also makes me feel that circumcision is of no special value in preventing masturbation.

CONCERNING SEXUAL INTERCOURSE BY BOYS AND YOUNG MEN BEFORE MARRIAGE.

		Per cent.
Did not answer		24
Denied ever having had sexual intercourse before marriage		43
Acknowledged it		33
Said they were under 20 years of age		26
Had sexual intercourse first—		
Before their sixteenth year	7	
At age of 16	6	
At age at 17	7	
At age of 18	4	
At age of 19	2	
Before the age of 20	26	

Of the 24 per cent who did not answer, it is fair to assume that some of them did have sexual intercourse. It is also possible that some of those denying it did not tell the truth. It is therefore probable that the actual percentage would be somewhat above 26 per cent. The predisposing cause was almost always attributed to the influence of companions (male or female), and to curiosity or the desire for new experiences. Rarely was it attributed to sexual desire. It would, of course, be the reverse with young men after they had acquired the appetite for intercourse.

The boy led in 31 per cent of the cases.

The girl led in 16 per cent of the cases.

It was mutual in 38 per cent of the cases.

Occasionally it was said that another boy led.

Between 7 and 8 per cent say they had given up masturbating when they commenced sexual intercourse; 15 per cent of those who commenced to have sexual intercourse say they then stopped masturbating; 25 per cent did not answer this question, or said that they never had masturbated; 60 per cent of those who commenced to have sexual intercourse say they continued masturbating nevertheless.

I think it probable, from the nature of some of the answers, that some of the young men stating that they had sexual intercourse before the age of 20 did so but once. On the other hand, the custom, once commenced, is usually continued. It is undoubtedly the fact that among young men past the age of 20 considerably over 50 per cent of them have sexual intercourse before marriage.

The moral tone of different communities or groups of boys (which may be good or bad, without regard to class) undoubtedly varies very much, and makes a great difference with regard to the prevalence of this custom.

A young man sometimes says he really must have sexual intercourse—that he is fairly crazy without it. This is often apparently so; but the real cause is probably in the fact that the habit has been formed and the mode of life is not such as to help him to control himself.

There is probably no greater ill effect from masturbation practiced—say once a week—than there would be in sexual intercourse practiced by the unmarried young man with the same frequency. There is the added danger to the latter of the possibility of contracting disease.

We have no evidence to show that continence is harmful. On the contrary, there is much evidence that points to continence being beneficial in the normal boy or young man who has had early and constant training in control. And so again I say I think the ideal for boys and young men should be continence—perfect self-control.

To the statement that is often made that a young man will lose his sexual vigor if he does not exercise it, I would answer:

1. The opinion of a very large proportion of the medical men I have inquired of is that if a man reach the age of 30 (the age I set for the inquiry) and has remained continent, he should be just as virile and just as able to beget children as one who has done otherwise.

2. The observation of domestic animals, controlled with exactitude, proves the procreative ability of males continent until well after full growth has been attained.

If boys early had their ideals established in favor of self-control, and if they were trained for self-control and in hygienic ways, mentally and physically, and if their minds were satisfied with proper knowledge, then temptations would be met with a probability of successful resistance. Before the first act with the opposite sex self-restraint is more easy than after the first step has been taken. After the habit has been established it may indeed be a difficult thing to check.

I shall devote the remainder of this paper to a presentation of (1) a method of sex instruction I have used with good results with large numbers of boys, showing how it can be used by others, both for older boys, who should have had the instruction when younger, and for boys from early childhood up, as they should have it, and (2) I will outline what I consider the essentials of the proper sex hygiene of boyhood.

SEX INSTRUCTION.

Of my tabulated cases, 66 per cent say they have had some sex instruction, though in many cases it was very meager.

Received sex instruction—	Per cent.
Before age of 10	1
At age of 10	2
At age of 11	2
At age of 12	2
At age of 13	3
At age of 14	11
At age of 15	10
At age of 16	16
At age of 17	7
At age of 18	12
At age of 19	0
Total sex instruction before the age of 20	66

The important fact to be noted here is the lateness of the instruction. Whereas 54 per cent commenced self-abuse before their fifteenth year, only 21 per cent received instruction up to that time, the balance either not receiving any sex instruction or not receiving it until after they had contracted the habit of self-abuse. The unanimous opinion of the young men is that boys should receive sex instruction, and almost all remark that the instruction should be given early. An objection is often raised to giving sex instruction early for fear that it may suggest to the boy thoughts we wish to keep out of his mind and actions we wish him to avoid. But if correct instruction is not given we may be sure that the boy will either receive some instruction from another source or that his own developing nature will prompt him to thoughts and actions that he should avoid. This fact is too frequently overlooked. If proper instruction is given early enough in his life, little by little, before he comes to the age of 10, when his sexual nature will soon commence to develop, and if the boy has constant inspiration to right living, not by spoken words so much as by true example, and if he also has proper and constant training and hygienic living, then the knowledge will have been obtained before the age at which it would arouse feelings and in time for it to be a protection, and with high ideals and habits of self-control established the boy is likely to meet these strong temptations successfully.

The information a boy should receive may be placed in four groups:

1. The secret of strength. (About the boy himself.)
2. The development of life. (Plant, fish, and animal.)
3. Human birth.
4. The young man in the world. (Relation of the sexes.)

Further on in this paper I present outlines for talks on these topics.

In a summer camp these talks may well be given as part of a course in nature study. In a school the talks should be given as part of a course in hygiene or physiology. In a home the material could be easily studied and understood by a parent, and it could then be used simply to answer a child's questions, or a series of evening "talk," or, better still, discussions could be held, for instance, on "Physical training," under which would naturally come (1) "Exercise," (2) "Bathing," (3) "Diet," (4) "Rest." These discussions one should work out simply, and they will prove very interesting to most boys. Whether they are actually held or not, on giving a talk on (5) "The secret of strength," attention should be called to the fact that it is one in the series which would not be complete without it, though usually in considering physical training—exercise, bathing, diet, and rest—the subject is considered complete with these four divisions. That is why the fifth topic may be called "The *secret* of strength," because most people avoid the subject and consequently know very little about it, though upon the knowledge and proper living according to it, more largely than upon anything else in his life, depends a boy's health and strength.

A parent should answer a child's questions frankly and truthfully. It would be well to keep a memorandum of the questions asked and answered and compare it from time to time with the outline of what a boy should know. Occasionally a boy does not ask many questions. In such a case a wise parent should volunteer a little at a time. Parents often see much more in a question than a child means to ask, and therefore hesitate to attempt to answer. It is best for one to take up the subjects as definite talks with a boy soon after reaching the age of 8. Repetition of these talks from year to year will serve two purposes—as a review that will fix the knowledge, and the boy will also at each talk learn something he did not learn before.

I present here outlines of the talks as I give them. I have made all the talks simple for two reasons:

1. So that any boy may easily understand.
2. So that any parent may easily be able to give them.

THE SECRET OF STRENGTH.

- The body—made up of organs.
  - Organ—a part of the body set aside for a special use.
  - Illustrations:
    - The heart.
    - The eye.
    - Glands— a kind of organ.
      - Excreting—to get rid of waste fluids.
      - Secreting—to form fluids useful to the body.
      - Illustrations:
        - Salivary glands.
        - Testicles.
  - The testicles (use diagram).
    - Their function to make the most useful "seminal fluid."
    - Seminal fluid—reabsorbed into the system. Gives strength and energy to all parts of the body.
    - Emissions—the natural safety valve for overabundance.
    - Talk at some length on: Vigor of mind and muscle. Caused by presence in the body of this most important fluid.
- Abuse:
  - Of the eye, for instance, by foolish irritation. might cause blindness.
  - Of the private parts, will prevent their performing their proper function, the formation by the testicles of the important seminal fluid. The whole body will therefore suffer from lack of this fluid in the body, hence the term "self-abuse" (masturbation).
- Result of self-abuse:
  - Moral, mental, and physical weakness. (Illustrate by examples.)
  - Caused by lack of important seminal fluid in body.
- Describe difference between bull and ox.
- Describe a eunuch.
- Tell boy plainly how different he would be without testicles.
  - Describe to him why.
- Tell boy plainly how he would be weaker with testicles performing their function poorly.
- Describe causes that may make it hard for a boy to resist temptation.
  - Company a boy keeps—Mental and physical influence.
  - Things a boy sees—Pictures—Shows.
  - Books.
  - Wrong diet, especially stimulants.
  - Tobacco.
  - Lack of exercise, especially out of doors.
- Recovery from weakness—Remove the cause—Nature restores.
  - Warn against quack doctors.
  - Speak of family physician as proper one to consult.
- What helps boys resist.
  - Knowledge, ideals, good companions, mental and physical occupation, and especially athletics out of doors.
  - Describe the Indian boy's morning prayer to the Great Spirit while in training to become a man.

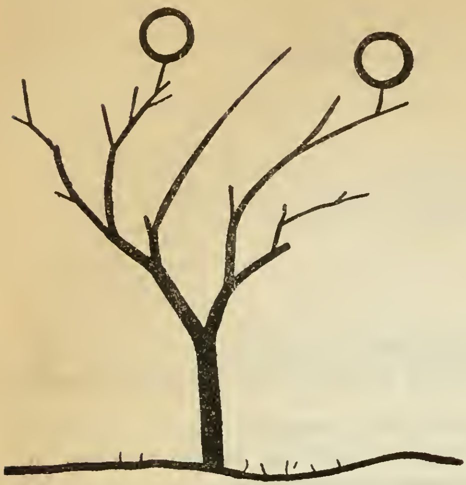

FIG. 1.—Diagram of plant containing only female flowers, to illustrate talk on "The development of life."

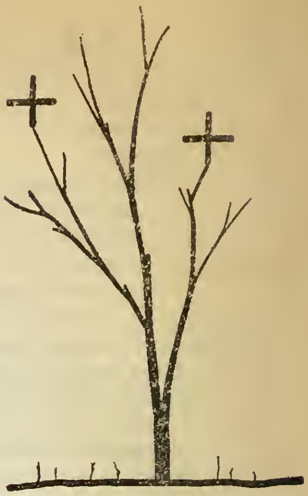

FIG. 2.—Diagram of plant containing only male flowers, to illustrate talk on "The development of life."

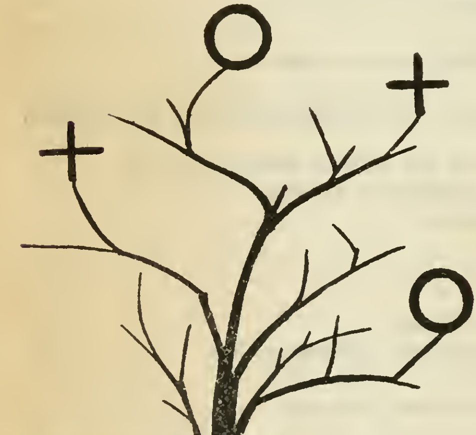

FIG. 3.—Diagram of plant containing flowers, some of which are male and others female, to illustrate talk on "The development of life."

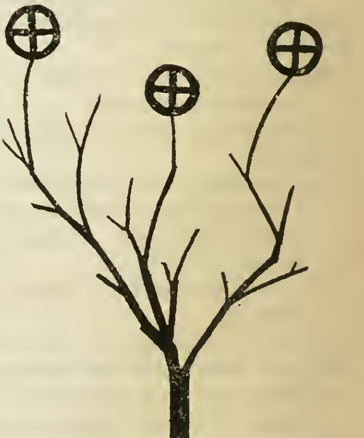

FIG. 4.—Diagram of plant containing flowers, each one of which is both male and female, to illustrate talk on "The development of life."

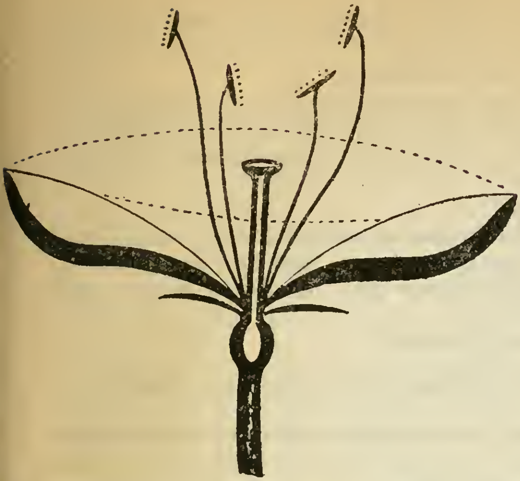

FIG. 5.—Diagram of typical flower, to illustrate talk on "The development of life."

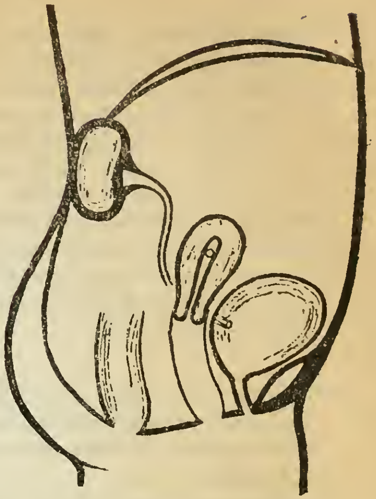

FIG. 6.—Diagram (1) to illustrate talk on "Human birth."

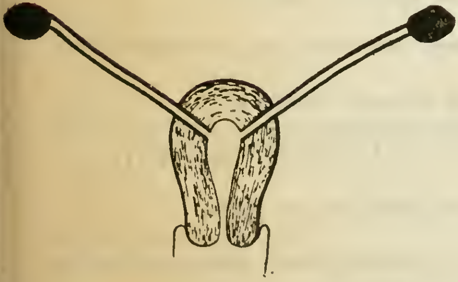

FIG. 7.—Diagram (2) to illustrate talk on "Human birth."

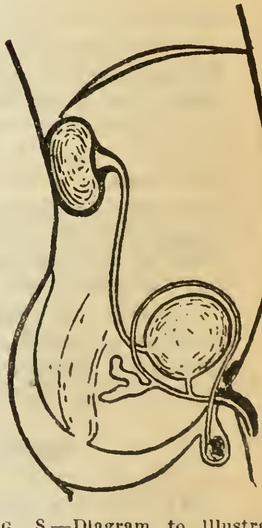

FIG. 8.—Diagram to illustrate talk on "The secret of strength."

THE DEVELOPMENT OF LIFE.

Describe a typical flower and its parts: Calyx, corolla, stamen, pistil, and ovary. (Use diagram to illustrate.)

Describe three different types of plants, as follows:

(1) Plant containing flowers, each one of which is both male and female.
(2) Plant containing flowers, some of which are male and others female.
(3) Plant containing flowers that are only male on one plant, with female flowers on another plant.

Describe pollenization—fertilization.

Describe fertilization of eggs of female fish, expelled from her body, by fluid (containing fertilizing particles, like pollen grains) from male fish's body.

State that in some animals fertilization takes place outside the female's body and in others inside.

HUMAN BIRTH.

Describe how all life originates from a single cell, the female cell joined by a male cell, causing fertilization.

Show diagram of human female body, describing parts concerned in development of young.

Impress upon boys reverence for mother's body.

Describe ovaries in which ovules are formed, periodical passing of ovules to uterus, preparation of uterus to afford a place for development of a new human being from ovule if fertilized, development of baby, and its birth.

Impress upon the boy that his health and right living will have great influence upon his own children later.

THE YOUNG MAN IN THE WORLD.

[For boys who have begun to develop.]

Review origin of life from union of male with female cell.

Warn boy against the very beginning of improper intimacies.

State plainly that having children is not a matter of marriage.

Speak strongly against unmanliness of wronging opposite sex.

Speak against shame to girl of improper relationships and of having illegitimate child.

After speaking of unmanliness of wrong to opposite sex, speak of dangers to boy.

The disgrace of having child when unmarried.

Danger of contracting disease—Gonorrhea—Syphilis (describe).

Warn boy against quack doctors.

Tell boy plainly that temptation is natural, but giving way to temptation is weakness, and dangerous.

Warn boy against little beginnings, as any notice of strange girls.

High ideals and right living should be cultivated from the very beginning. The boy should be impressed with the fact that he himself is responsible.

MENTAL AND PHYSICAL HYGIENE OF BOYHOOD.

We must not forget that our own lives will have greater influence for right living in boys than anything we can say.

We must not forget that all habits of mind and body have little beginnings. It is the beginning that is most important, therefore commence early to train.

Mental habits should be acquired of admiring strength, uprightness, and cleanness, and of liking to do hard things. The only method I know of is by giving the boy personal examples and inspiration.

The physical habits of obedience, promptness, and activity should be acquired.

Simple life should be lived by the boy. Luxurious life, preventing activity, must be avoided. Active lives and light, free clothing are essential. Cold air and cold water in frequent doses on the surface of the body is a strong help toward continence and also an almost certain preventive of colds. Free drinking of water between meals is also good. It is most important that the diet be simple and non-stimulating, and that the boy should learn not to overeat, though it must be remembered that a growing boy needs considerable nourishment. Occasional short fasting or skipping of a meal may be used to good advantage in training a boy to and showing him that he can control his appetite. It is best to do this with a boy in a natural way, as when off fishing.

Frequent nakedness in the presence of other boys (as with brothers, in the dressing and bathing rooms of gymnasiums, and at camp) and in the presence of proper men, if there is supervision—a natural and easy supervision that is not apparent as such to the boy—will result in a mental attitude that is the opposite from the morbidly curious, and that may easily be directed toward admiration for cleanness, health, and strength.

The last few paragraphs are meant merely to suggest some of the definite details that should be observed in the hygienic care of boys.

We too frequently either wish for certain results without making definite effort to attain the results, or try to attain results without sufficient attention to details.

Every boy should have definite physical training (with much more attention to details than is usually given) for two of the following three reasons: (1) If delicate, physical training will build him up; (2) if robust, physical training will turn softness into hardness, physical and mental; and (3) whether delicate or robust, physical training will develop self-control, and at the same time lessen sexual impulses, which otherwise tend to run riot.

I can not state too strongly my belief in two things: First, that boys, in order to grow up with self-control, especially in sex matters, must have, with ideals and knowledge, a very considerable amount of physical training, including really hygienic living (diet, etc.), plenty of hearty exercise in the open air, and physical discipline in the form of athletics and gymnastic drill; and, second, that for perfect physical training continence is necessary in boyhood, and, conversely, physical training is a very great help toward continence. By physical training we can not mean simply the development of physical strength; we must mean the development of physical power with control.

As exercise without interest is comparatively valueless, so physical training must include not only physical exercises and hygienic living, but also a knowledge of these things and ideals.

The usual way with boys nowadays is practically to let them drift. But if you wish results with any boy, he must have positive influences of ideals, education, and training.

If a dog has grown up without training, it is very hard to break him of habits formed. It is equally hard with a boy. There must be *training*, and it can not begin too early. The boy, as the dog, should have training in right habits and in obedience, but the boy should also have will training. There must be *knowledge*, for without that the boy mind will not be satisfied and his body will lack guidance. The knowledge should be acquired when the boy seeks it, and that will be early and constantly. Ideals there must be also, for without the *inspiration* of ideals the boy can not reach his best. With training, knowledge, and inspiration anything is possible for a boy.

TUESDAY MORNING, SEPTEMBER 24, 1912.

HYGIENE OF CITY INFANTS AND BABIES.

Prof. Dr. Adolf Baginsky, Königl. Friedrich Wilhelms Universität, Berlin, Germany.

When the president of Section III told me that I should present a paper on "City babies" I believed it impossible to prepare such a paper with the narrow limits which a congress allows. Consider the many valuable books on this subject which have been written by Americans, to say nothing of us "schreibselige" Germans, to whom baby life is the most precious of the nation's treasures. How can I present something new, something not known long ago in America, or not fully discussed in the American Pediatric Society? On the other hand, it is inevitable that the hygiene of city babies should be discussed at such a congress. Specialists, researchers, pediatricians, and hygienists are here from all parts of the world, and we may confidently assume that the knowledge of child nature and child life will be promoted by the mere exchange of ideas in the manifold dangers and injuries to child life under the extremely diversified conditions of climate, customs, and subsistence. It is possible in this way to turn new light on many doubtful questions and to solve some of them.

I will only mention the great question, constantly discussed, what are the causes of the greatly increased infantile mortality during the summer months in great cities, the question whether summer complaint, with the predominating picture of cholera infantum, is an infectious disease; whether it is only a disease of the intestinal tract caused by the food which so easily decomposes in children, or whether it is due to direct injury of the infantile organism by hot weather under unfavorable nutritive and living conditions. When we discussed this question many years ago (1884) at the Medical Congress in Copenhagen—my friend Jacobi will certainly remember it—there arose a most lively controversy. The speaker expressed most varied views without coming to any agreement, and to-day, in spite of numerous studies and diligent work, this important question is yet unsettled, though much has been contributed to set the question in a clearer light than we had when the science of pediatrics was still in its beginnings. In this classical country of summer complaint it may, therefore, be of great value to know the views and experiences of representatives of various regions and of other countries. We shall not thrash empty straw when we here again discuss the hygiene of city babies. Therefore let us hope that, though many old things will be repeated, many new ideas may be developed.

When I see, year after year, the seriously weakened children pass before my eyes in the policlinic and in the hospital under my direction, when I walk with a younger colleague through the beautiful rooms of the division for infants and older children with internal diseases, if I compare in my mind this misery, the causes of which, with relatively few exceptions, are easily found, with the rounded, well-formed, and lively newborn infants when they slip from the mother's womb, one thought fills my mind—that there are only two influences, two factors, which produce, sometimes in an extremely short space of time, the grave and death-dealing change, the inability to preserve the child's health and life.

(1) Lack of means, misery with all its accessions.

(2) Lack of knowledge, complete ignorance of what is necessary to preserve the health of the newborn and to develop the powers which nature has bestowed. I do not take into consideration the relatively few exceptions, cases where the infant is born with reduced health, as in cases of congenital syphilis or other congenital defects; neither do I take into consideration cases where, from the first day, love is absent and criminal conduct endangers the life of the newborn, nor the practices of women known as "angel makers." Poverty and ignorance are the chief destroyers of child life and child health, and from these two sources flow, in swelling streams, the injurious conditions which sweep the young to destruction. Much less important are those other causes which lower the vitality of the child, as heredity or feeble vitality brought by the child into life by way of accident or unusual conditions—Poverty!

> Famine is in thy cheeks,
> Need and Oppression starveth in thine eyes,
> Contempt and Beggary hang upon thy back.
> The world is not thy friend, nor the world's law.
> —Shakespeare.

Can more be said in words so few? We must, above all things, take up the battle against poverty and ignorance, and this in the widest scope, if we wish to promote the hygiene and the care of the children. Both affect child life in great cities more severely than in country districts, because the living conditions are more difficult, more complicated, in large cities; because the increased needs of adults entail a more stringent limitation, reduction, and deterioration of the living conditions of children; and because ignorance is not so far diminished as might be supposed from the generally higher civilization of great cities. Superstition and unreason are common in great cities, under different forms perhaps, but to the same extent as in the country. The influence of poverty and misery is best shown by the preponderating mortality of the illegitimate children. I will not put before you figures from all countries, for they are well known. I present only a few figures from my own country.

Of 1,000 infants born alive in the Kingdom of Prussia, there died:

	1881-1885	1886-1890	1891-1895	1896-1900	1901-1905
Legitimate	194.64	195.35	192.57	188.74	179.08
Illegitimate	351.22	258.04	357.68	355.94	330.56

Thus the mortality of the illegitimate children is 1 in 3, and that of the legitimate, 1 in 5 among the new born. Tugendreich gives almost the same proportions for the whole German Empire, namely, 19.3 deaths among the legitimate, as compared with 32.7 deaths of the illegitimate children. All writers agree in this—that this preponderating number of deaths among illegitimate children is due to their social misery, beginning with the withdrawal of the mother breast, and continuing through the impossibility that they shall be adequately cared for or properly established in life. No natural laws, says Tugendreich, in his work on protection of mothers and infants, prescribe the mortality of infants; the immediate causes are faulty hygiene, false teaching, and superstition.

If this is recognized, it shows us at once that child hygiene must begin with the improvement of social conditions in general, with the fartherest possible removal of poverty and misery, with the prevention of the injurious influences proceeding from poverty and want, and also with the removal of ignorance, inexperience, and superstition.

The child lives and subsists during fetal life on the body of the mother, in which it develops and builds up its organism. What the mother suffers in want and misery, the developing infantile body also suffers and brings with it, as defects, into the world, in spite of the provisions of nature to counteract, as far as possible, their influences. Therefore, the care for child life does not begin when the child is born, but during pregnancy. Very gradually this self-evident truth penetrates the consciousness of humanity, and very gradually humane social efforts and legislation begin to express interest in the protection and care of motherhood. Biedert, in his observations on child mortality in France, with regard to country and city, has shown that the mortality in the country districts has declined in the last 10 years at a higher rate than in the city, which proves that preventive measures in the cities have been greatly inferior, especially as to the protection of motherhood. Therefore, we must promote the measures which are calculated to help the mothers. In cities they suffer most, partly because even the legitimate mother may be compelled to do hard work until date of birth arrives, but partly because care and want, psychical and bodily depression hang over the illegitimately-pregnant women in large cities and cause defective development of the child. The third section of the International Congress for the Protection of Infants discussed legislative and administrative measures, and Bruno, of Heidelberg, discussed insurance of motherhood, as special topics.

"No effective protection of infants is possible without adequate provision and care for the mother," is one of Bruno's basic principles, and therefore, as one of the most important requirements of legislation, he demands the establishment of motherhood insurance. He also demands that pregnant women be excluded from occupations injurious to health, that working time be reduced, and that several weeks of rest be reserved to mothers before the expected birth. Some civilized nations have begun to take up motherhood insurance, first of all, France with her "Mutualité maternelle," whose beginnings reach back even to 1714 and 1748, and whose purposes are of late years intensively and effectively furthered by Félix Poussineau. Hungary, Italy, and Austria have made laws for the same purpose, namely, to protect the mothers against want, during pregnancy and the puerperal state, by money contributions and later on by nursing premiums. Germany adopted, in 1910, a law providing for assistance of mothers in childbed and also during pregnancy. It is an inadequate law, and does not satisfy the liberal parties, but it is a foundation on which we shall be able to build in the future. The law says that only assistance in the form of attendance, of financial aid up to six weeks, nursing money to the twelfth week, medical aid, and so forth, may be granted, and at that the law is not mandatory. In America, says Bruno, there exists no protection of motherhood. I do not know if this is correct, but it was strange that none of the American gentlemen present spoke up for America, while Félix Poussineau, Vivien, Fernand, and Merlin showed the success of the "Mutualité maternelle," spread over the whole of France, in its full light, by stating that since the establishment of this social institution of motherhood insurance, the mortality of infants has decreased by 50 per cent.

Therefore, protection of mothers by way of social self-help and legislation in the form of pecuniary aid to pregnant and puerperal women during a period of at least six weeks, and in the form of social-hygienic care, together with nursing premiums for several weeks or months, according to the necessity, are measures which we should promote in the interest of the hygiene of city babies. Concerning nursing premiums, I add a few explanatory remarks because I omitted to mention the reasons for it.

Nature supplies in the secretion of the mother's breast a means of overcoming the evil effects of poverty and want. I do not want to sing here the praise of mother's milk. Far back in the earliest years of civilization social writers praise the feeding of the infant at the mother's breast. We may only read Tacitus, who praises the German women. Plutarch, Soranus, and all the others down to the present day have repeated the same thing, that for the child all blessings flow from the maternal fountain provided by nature. On the other hand, we hear complaints about the refusal of these blessings under the influence of a civilization which ignores nature. Therefore the same phenomenon repeats itself, that with progressing civilization the discussion of maternal nursing makes its periodical appearance. At present we have again entered such a period, and only those who do not know history will think that it is the recent times *κατ' ἐξοχήν*, which have invented the arguments to prove that women should nurse their own babies. This question has always existed; it has been neglected or forced into the background again and again, and yet has risen again with irresistible power. In one thing our times surpass the earlier ones, namely, that under the force of circumstances the possibility of the mother giving the child her breast has very much decreased, though not entirely disappeared. But here not poverty nor want are the deplorable factors; on the contrary luxury, pride, false notions, vanity, and frivolity are the motives to repress the highest of motherly duties. There is only one remedy; to awaken the sense of motherly duty by the spoken and written word.

But with regard to the mothers whom poverty and want prevent from performing their motherly duty, it will be the task of social endeavor and legislation to assist them, and, for the great majority of women, this can best be done by nursing premiums, either in the form of money, food, or boarding institutions. For this reason nursing premiums are placed on an equal basis with motherhood insurance. With these, and with protection of numbers of the poorer classes, we have gained a strong point, in that it has been made possible to provide for child hygiene, a thing impossible without funds, for here, as in all branches of hygiene, every progress demands money, and again more money.

Considering the further development of hygienic postulates from the viewpoint of modern science another important point impresses itself upon my mind as of at least equal importance with the amelioration of poverty and want as they affect mothers and children, namely, education and training of mothers in the care of their children. It is useless to supply means, or to relieve need, if mothers do not know how to make a proper use of the means furnished. We frequently find that children in the well-to-do families, under most favorable circumstances, are badly cared for, decline, and finally perish, because all knowledge of child care is lacking. No experienced practitioner will deny this. When I learned this from years of observations I took occasion, when the German Empress initiated in Berlin a movement among the women for the protection and care of infants, to suggest an association for the purpose of establishing small, well-regulated schools for the training of women who would devote themselves to the social task of caring for children and who would be educated as teachers.

Women thus trained might go out among families and teach mothers how to take care of their babies. The instruction would cover all matters of general hygiene, all questions of cleanliness and ventilation of dwellings, prevention of infection, and so forth. This undertaking was at once approved and supplied with funds, and many of my pupils and assistants gladly offered themselves as instructors for the women who would take the course. It was intended that the women thus instructed should pass a simple examination and obtain a certificate of their ability to teach mothers who were in need of instruction. Carefully as it had been planned, and energetically put into practice, the undertaking failed for want of earnestness in the execution. Some of the women regarded the course of study and the examination as sport, and I soon found women who did not know more about the care of children after the course than before, and who thought their common sense quite sufficient. Foolishness, superstition, and prejudice were sometimes carried away and communicated to mothers who needed assistance. Thus the undertaking failed; I can not tell if it will be taken up again. The question of maternal instruction had to be attacked in another way. The fact that in almost all European countries a certain preparation, a certain test, is necessary for the practice of any profession, and without which no professional work is sanctioned by the State, led to a demand that women seeking employment in the care and education of children should have a certificate of their ability. If in Europe no teacher, no tradesman, no physician, no lawyer, can practice his profession without having passed an examination, there is surely no reason why a woman should be permitted to practice a profession which is of high public importance, namely, to care for children, without even an effort to acquire the necessary knowledge. Thus we come to the introduction of instruction in child care for mature young women. We hear much at present about the necessity of sexual education. But the education of the young women in the duties and tasks of motherhood is much more important. It should be impossible for a girl to become a mother without having the least idea how to rear, feed, and care for a baby, and how to protect it from disease.

I therefore demand—and this is the second important postulate regarding child hygiene, not only in cities but also in the country—that the young girls receive a compulsory course in school on the care of children and on the whole field of child hygiene.

Thus we would establish another important foundation for child hygiene with unmeasured blessings for the families spared from grief and misery, needless expense, and anxiety; benefits, also, for the State, in great numbers of well-developed, healthy, and efficient citizens who, likely to have perished, have been happily preserved.

And now we may consider what ought to be taught in these courses for young girls:

(1) The importance of bodily cleanliness, bathing and clothing, necessary information regarding temperature, protection of the child against heat and cold, the necessity of keeping the child dry, and so forth.

(2) The knowledge of nutrition, beginning with the immense importance of the mother's breast for the whole future life of the child, the care of the milk bottle, of the milk, and so forth; knowledge regarding the quantities of food to be given, protection against underfeeding and overfeeding, the difference between carbohydrates and albuminous food, and so forth.

(3) Division of time of the day for the child, necessity of sleep and waking, time of giving food, necessity of fresh air, and so forth.

(4) The knowledge of the dangers of infection, with special consideration of the most important children's diseases, their origin, transmission, and so on. All this in a simple, popular form, adapted to the minds of the lower classes.

(5) Reeducation out of false notions, superstitions, and foolish legends concerning the care of children (for instance, the false belief in dangers from teething, the belief in the evil eye, and in charms against it, the nonsense of amulets, and so on).

Thus education would establish a foundation on which the care of children could be well developed.

The advancing growth of the child brings into view the question of its proper sustenance, as far as it may be affected by poverty of parents or of mothers, and especially of illegitimate mothers; legislation and social endeavor must now take up the task and protect the helpless child. Let us first consider the more needy, the illegitimate child. We are fully informed as to the poverty of illegitimate mothers and as to the frequency of illegitimate fathers who shirk their duty. Some countries do not compel the illegitimate father to perform his full duty, but demand merely that he shall maintain his illegitimate child. I remind you of the law of the French code which forbids to "chercher la paternité." It is different in Germanic countries. There the rights of the illegitimate child have been better and better established during the last two decades. In recent years they find their best expression in the appointment of a legal guardian. This is called the Taube system, after the Leipzic pediatrist, Taube, who fought energetically for its introduction. According to this system a legally constituted authority looks after the interests of illegitimate children, energetically compelling the illegitimate father to do his duty. This system at once does away with the poverty of illegitimate children and creates a certain safeguard for their proper bringing up. But it ought not to be carried too far, and the illegitimate child should not be granted privileges to the disadvantage of legitimate children who may be born later—i. e., illegitimate children born before marriage must not take away the means of subsistence of later born, legitimate children. The legitimate later children must not suffer on account of the illegitimate children. With this limitation the Taube system of a legal guardian must be unreservedly approved, and may be considered as a third important postulate for the hygienic care of children. Another question is that of the permanent hygienic supervision of children who are cared for in private families and private and public institutions. Our times have accomplished much good in this field, as the supervision has been taken away from the merely administrative and executive authorities and has been placed in the hands of medical officials, who are assisted by a staff of specially educated male and female helpers who protect the children from injurious influences, giving timely attention when sickness occurs and providing for their transfer to a hospital.

The hygienic care of these city babies is thus assured. This institution inevitably requires the establishment of children's, and especially of infants', asylums, where helpless children find a home, not only at the infantile age, but sometimes at a more advanced age. Municipal children's asylums—whether children are kept only for a short time and then transferred to private families or whether they are kept for a long term—must be provided with all the apparatus, rooms, and halls which modern child hygiene demands. In this manner, the illegimate children are better cared for than the legitimate children of poor families. But here, where the duties of parents are rightly placed in the foreground, social endeaver has stepped in to assist the needy and provide them with instruction, and thus a very important work has been accomplished. The collective social effort for the child, splendid as it is, has made a great impression in recent times, and has here, in fact, found its great tasks, which are performed in widely different ways. In a short review I may mention:

(1) The institution known as "Gouttes de Lait," first established for infants, but gradually extended to older children. These institutions are maintained under the direction of enlightened physicians, and furnish the poor pure food, milk, etc., assist poor mothers with nursing premiums in money and food, keep the children under constant supervision, give advice to mothers, and render medical aid in cases of slight sickness.

How extensive the work of these offices is may be seen from the fact that the city of Berlin spends annually $75,000 for these offices, distributed throughout the city. This movement, originally starting in France, has gradually extended over the whole civilized world, and has assumed a complete international character, as is shown in this congress.

(2) The establishment of children's homes (Kinderkrippen), charitable institutions, where children of the working people are kept and cared for while the parents are at work. These homes are used, like the "Gouttes de lait," for the instruction of parents, and thus contribute to hygienic progress. These are hygienic institutions intended for legitimate children; their establishment is recommended everywhere, but especially in cities having a large working population.

We can thus formulate a fourth postulate for the hygiene of city children. The State and municipal provisions for illegitimate and legitimate children must be accompanied by correlated institutions of social endeavor, by the establishment of "Gouttes de lait" and offices for the advice of mothers and the introduction of children's home for the working population.

We have now considered the infants and have said something about older children. What are the hygienic needs of the older children, who have passed beyond the infantile stage? I have lately pointed out, in a lecture on charitable institutions for children in great cities, what is needed in order that the advantages secured in infancy may not be lost in childhood; I have also had occasion to point out how remiss we are in the care of children immediately before the school age (3 to 6 years). The State, the communities, and social workers are in arrears with respect to these children, not only because little is done for them, but because what is done is done in a wrong way—here too much, there not enough. I therefore demand the establishment of a central office in every city for the proper distribution and use of the means furnished. Through such a central office every city will be able to do good work, and yet also to guard against abuse, and to bestow on just those who need it the necessary hygienic care and supervision.

What are, then, the hygienic needs of these city children? They may be measured and estimated by the injurious influences, with which children are threatened in city surroundings. All social disadvantages, want, and poverty and misery affect city children more severely than country children. But surroundings free from poverty and misery, and even surroundings which allow a certain amount of comfort and prosperity, are not free from dangers to health and life. It is true the rich are the few in the city as well as in the country; for the upper 10,000 no charitable institutions and protective measures are needed; for them, instruction and education are sufficient, as the rich are able to protect and help themselves.

The evil influence of city surroundings are very numerous, and hard to define and mention separately. The most important ones are these:

(*a*) Deterioration of the air by smoke, dust, dirt in the street, and in the dwellings.

(*b*) Crowded dwellings, when too many people have to live in a narrow space, and so lack necessary air space; this is the more injurious, the greater the lack of ventilation.

(*c*) Lack of sunlight and, at the same time, excessive heat during summer in dwellings and streets.

(*d*) Lack of open places for free exercise, and, in many cities, the lack of proper provisons for skating, bathing, and swimming in the open.

(*e*) The direct dangers of city traffic.

(*f*) The increased danger of infection from contagious diseases by close contact of children in school and in their homes. To this I add a number of psychical dangers, if I may so call them.

(*g*) The dangers to the mind from excitement; street noise, music, and pleasures, the social precocity in family and society (societies, dancing, and the like), with all the dangers of precocious development; in poor families, early morning work, and overwork.

(*h*) Immediate exposure to the use of alcohol and to sexual indulgence.

Such are the dangers which beset children in the cities, and it is necessary to take a stand against them.

It is clear that we should have to traverse the whole field of hygiene in order to take up in detail the hygiene of dwellings, of schools, of child work in factories and at home, of the street, and of social life. I will only allude to them, and take up a few for the sake of discussing hygienic measures against them.

If we pass over the important infectious diseases, as whooping cough, diphtheria, the acute exanthematous fevers, which in great epidemics may also threaten country children, we find that it is above all the chronic diseases, as rickets, scrofula, tuberculosis, and anaemia which especially affect the city children. The number of rickety children, for instance, can not be established with certainty, but this much is known, that among children of the middle classes, who were not fed on the mother's breast, a great many are affected with rickets, and among children of the lower classes rickets is still more frequent. In other great cities of Central Europe conditions are no better. Similar conditions were reported years ago from Vienna. What has been said of rickets is true of anaemia. Really healthy-looking red-cheeked children are, I will not say rare in great cities, but by far less numerous than among country children. I do not want to exaggerate, for, on the whole, conditons are not so bad, as we might a priori expect. It is true that conditions are improving under the influence of hygienic measures and institutions, which are gradually being established, and of which I shall say more later on. They have been introduced in a great number of cities, among which Berlin may be mentioned especially. The spread of scrofula and tuberculosis, however, is still extensive. I have before me statistics gathered in Berlin by Albert Kohn in 1911 for the annual meeting of the central committee for the prevention of tuberculosis.

These statistics show that the children of 196 tuberculous parents of the working class who belong to the Mutual Sickness Insurance Association, were also affected with tuberculosis. From the examinations by means of the tuberculin reaction (Pirquet, Moro) it was found that in cities like Berlin, Vienna, Paris, where tuberculosis is very common, the reaction was positive in 51 per cent among children of 2 to 4 years, in 66 per cent among children of 4 to 7 years, and even up to 84 per cent among children of 7 to 14 years. It is probably the same in all great cities of the world—here a little less, there a little more. But the early infection of the children is an established fact, and just as well established is the fact that the children are infected on account of the crowded living conditions in the cities, so that, as I have said, years ago, tuberculosis is a disease of crowded dwellings. Here then we recognize, in a few instances, casually mentioned, the influence of city surroundings on the causation of disease and sickliness among children. What measures are then needed to to improve the hygienic conditions? Again it would be necessary to fill a book, nay, a number of books. The school hygiene, which I published, fills two rather large volumes. Hospital hygiene has been the work of my life, and many hundreds of writers, among them not least the Americans, have made it their life work to plan improvements in hygiene, and to put them in practice. Thus only the most important points can be mentioned:

(1) The improvement of living conditions of city dwellers by practical hygienic building, by the prevention of crowding, by strict supervision and legal enactments.

(2) Keeping the streets clean from dust and dirt by frequent washing and sprinkling.

(3) Eliminating the smoke nuisance in cities by means of apparatus for burning the smoke.

(4) Good school buildings and their hygienic supervision, open-air schools for sickly children whose condition permits instruction in the open air, besides proper changes in the plan of studies, of instruction, and of feeding the poor children in school; the appointment of medical inspectors for all schools; the establishment of large playgrounds.

(5) Establishment of bathing places, especially of swimming baths, carefully and hygienically conducted.

(6) Establishment of open-air sanatoria, vacation colonies, sea and ship sanatoria for sickly children, by which it is possible to keep these children away from the city for several weeks.

(7) Careful supervision and legal measures for combating acute infectious diseases by compulsory notification, disinfection, and so forth; and last, but not least, general and compulsory vaccination and revaccination.

(8) Prevention by law, and, where that is impossible, the regulation of child labor in factories, shops, and industrial occupations.

(9) Careful and strict supervision by legal authorities and social endeavor bodies of children exposed to dangers by alcoholism of their parents, and also of the children endangered sexually.

(10) Transfer of sickly and diseased children to special sanatoria and hospitals. (Tuberculosis sanatoria for children, and other children's hospitals.)

Perhaps, and even probably, you have expected new things from me and you have been disappointed, as all that I have told you was known to you before this. But I must console you with the fact that useful, necessary, and beneficent things may be repeated frequently, but can never be told too often. Let us take it from the best side: "Prodest repetitio, semper aliquid hæret!" Let us stick to it. All that we do for our children is work for the great Cosmos; for, in our children, we preserve the race and the living world!

ST. MARGARET'S HOUSE, ALBANY, AN INSTITUTION FOR THE CARE OF BABIES AND THE TRAINING OF NURSERY MAIDS.

Dr. Henry Larned Keith Shaw, Union University, Albany, N. Y.

The care of institution babies presents many serious problems. Last year, in New York City, 42 per cent of all the deaths under 1 year of age occurred in institutions. There are 13 institutions and hospitals in New York State devoted exclusively to the care of young infants. These are all inspected by the State Board of Charities, who require reports of admissions and deaths. There were 3,394 infants admitted to these institutions in 1902, and, in the year 1910 there were 5,619 admissions. The deaths, in 1902, numbered 1,148, a mortality of 34 per cent, while in 1910 there were 2,183 deaths, a mortality of 38 per cent. This tremendous death rate, which is apparently on the increase, calls for careful consideration of the conditions existing and the methods employed in these institutions. It cost $53,000 to maintain these 13 institutions in 1902, and $90,000, in 1910. The increase of $37,000 is in about the same ratio as the number of babies admitted.

The purpose of this paper is to describe one of these institutions, located in Albany, N. Y., a city of about 100,000 inhabitants. St. Margaret's House and Hospital for Infants started in a very modest way, in caring for one small baby, in 1883. This baby died after a few months, but was the seed from which the present structure has arisen. The sympathy of a number of charitable people was aroused, and a building was secured and remodeled for the care of young infants. For some years the work was affiliated with and under the same management as the Child's Hospital. The present building was completed in 1896, and was specially constructed for the care of infants, and is well adapted for that purpose. There are 11 small wards, with a capacity of from 2 to 8 cribs, and 2 private rooms, which are furnished and equipped as model nurseries. The capacity is 60 cribs, although it frequently happens that 70 or more babies are in the house at the same time.

Age is the only limitation to admission, and any infant under 12 months of age, who may be in need of careful nursing and diet, is received. They can remain until they are 2 years old, if their condition requires special care. Foundlings, illegitimate, and deserted infants are admitted on an order from the commissioner of charities. A study of the 2.326 infants which have been received since the institution was established shows that only 2 per cent were foundlings, but that the number of illegitimate babies outnumbered the legitimate by more than two to one. There has been a marked increase in the past 10 years of sick babies sent by their parents for active medical treatment.

Lack of air space and insufficient ventilation are the greatest faults in many similar institutions. The air space per infant in some of the wards is not over 500 cubic feet, still the ventilation is perfect. This is accomplished simply by the use of cheesecloth in the place of glass in the upper sashes of all the windows. A constant current of fresh air is thus secured, which renders a large amount of air space for each child less imperative. A satisfactory method of ventilation is thus secured at practically no cost and without any danger of drafts. The air is sweet and clean, and there is a noticeable absence of objectionable odors. The babies' napkins are always changed in an adjoining room reserved for this purpose, and are never removed in the wards.

The most valuable part of the equipment are three piazzas which are screened in the summer and protected by glass in the winter. These piazzas will each hold 20 cribs very comfortably. An outdoor ward was constructed a year ago, and now all the babies can spend the entire day practically out of doors without any exposure. This permits the wards to be thoroughly aired during the day. In hot weather, all the cribs are kept on the piazzas day and night.

The general supervision of the work is in charge of a nonsectarian women's board of managers. This board is divided into small committees having special duties and responsibilities. There is a small endowment fund, but the financial support comes mostly from voluntary subscriptions and the board of the babies. The average cost of maintenance is $12,000 a year. The immediate direction is in the hands of a superintendent appointed by the managers. The medical staff consists of a consulting board and a nonresident physician in charge, whose services are gratuitous. A careful physical examination is made when each baby is admitted, and a daily feeding and stool chart and a weight chart are kept for each baby.

The main and most important problem to be solved in the care of babies, whether they be sick or well, is that of diet. The preparation and preservation of the food, therefore, receives most careful attention. The milk is obtained from a certified milk dairy and is studiously adapted to meet the individual needs, powers of digestion, and assimilation of each infant. This milk is neither pasteurized nor sterilized. Whenever possible, a wet nurse is employed to give breast milk for one or more feedings in selected cases. This should be done in every similar institution, for it has been the means of saving many lives. The diet kitchen, where the bottles are prepared, has tiled floors and walls, and the most rigid cleanliness is enforced, and the nursery maids are required to wear clean, white gowns. The refrigerators occupy an adjacent room specially constructed for the purpose of cooling bottles, and a temperature of from 45° to 50° F. is maintained.

One of our most distinguished pediatricians, after a visit to St. Margaret's, wrote the following letter to one of the managers. It may be permissible to quote freely from this letter, for, in the words of Solomon: "Let another man praise thee, and not thine own mouth; a stranger, and not thine own lips."—Proverbs, xxvii, 2.

> My visit to your St. Margaret's House is among my dearest and most impressive recollections. Of more than 50 babies and very young infants, reared on artificial foods, with the exception of those whose deaths had nothing to do

with their feeding and were unavoidable from birth, not one died in more than six months; indeed, not one was ever sick. It did me good to see so many little ones smiling at the strange visitor, and I envied your city for having accomplished what is generally considered impossible. For it is a fact that it is extremely difficult to raise the children of the poor on artificial food, and particularly in public institutions. Painstaking care in housing, nursing, preparing the food, and establishing regular habits has performed wonders. Your contributors must feel amply paid for their goodwill and generosity by making an occasional call on the little ones whose lives they save and whose health they preserve, and by the example they give and the practical instruction they furnish both to the community and the medical profession. Such a result is a wondrous gratification to beneficent people, not to speak of the blessing conferred upon the community at large, by averting invalidism and by raising healthy and able men and women. It is the first few years of life that are the making of the adult.

A study of the admissions and mortality from 1885 to 1900 shows that the mortality ranged from 26 to 51 per cent, with an average of 38 per cent. During this period the mothers were permitted to live in the institution and to nurse their babies. They helped in the care of the house and in looking after other babies. From 1900 to 1912 the mortality ranged from 10 to 25 per cent, with an average of 16 per cent. This lessened mortality has been coincident with the establishment of a training school for nursery maids and a closer individual study of the digestive capabilities of each baby. These figures are a most convincing proof of the need of trained care in reducing infant mortality.

St. Margaret's does a great deal of educational work. It affords an opportunity for the students of the Albany Medical College to observe the methods and results of infant care and feeding and gives them an intimate knowledge of the commoner ailments of infants. Small sections of students are given instruction in the wards twice a week during the college year. A large number of visitors go through the building yearly, and the model nurseries and diet kitchen are seen by many mothers and illustrate how such rooms should be furnished. Not infrequently mothers are instructed in the proper methods of preparing food and of bathing the baby. Student nurses from other hospitals in the city visit St. Margaret's each year, where the workings and methods are explained in detail.

Perhaps the most important educational work is in the training of nursery maids. A training school for nursery maids is distinctively and peculiarly an American idea. The Babies' Hospital of New York was the first to provide this special training, and Dr. L. Emmett Holt is entitled to the credit of establishing the first training school. The demand for such training is shown by the fact that there are now over 20 similar training schools established in this country, besides several in Europe. The training school at St. Margaret's was modeled after the one in New York and was started in 1900. The report of the board of managers for that year states:

> A training school for nursery maids has been added this year, which secures, in the first place, better doing of the work, and, in the next place, will before long provide, from year to year, a well-trained company of young women, ready to go from it, trained and tested for the difficult and important duty of caring for little babies in their homes.

The following, taken from the information circular, which is sent out to the applicants for admission, will show the qualifications required and the duties demanded:

> Applicants are received any time during the year when there is a vacancy, and a personal interview is always necessary when it is possible. They must be between 20 and 30 years of age, have a common-school education, furnish two references, written by employers, as to character, and be perfectly healthy. If, after having been accepted as a member of the training school, a pupil's health is not what it was represented to be, she will be asked to withdraw before finishing the course. No married woman or widow received. The course of instruction covers a period of eight months. (Six months in the hospital and two months at service under its supervision.) After having passed a satisfactory probationary term, which is from two to six weeks, and having been accepted as members of the training school, pupils then wear the hospital uniform, which they purchase at their own expense. The superintendent has full power to decide as to their fitness for the work and the propriety of retaining or dismissing them. She can also, with the approval of the committee, discharge them at any time in case of misconduct or inefficiency. Probationers do not wear the hospital uniform, but should come provided with two wash dresses and at least six white aprons. Pupils are boarded and lodged at the expense of the hospital and receive $5 a month. At the end of eight months, if a satisfactory examination is passed, they receive a certificate and places are found for them at service in private families at $25 a month.
>
> Hours of duty: Day duty, from 7 a. m. to 7 p. m.; night duty, 7 p. m. to 7 a. m., each nurse in turn serving two months on night duty. Nurses also serve two weeks each in the diet kitchen. If the service permits, each nurse is excused from duty one afternoon every week after 2.20 o'clock; they are also allowed a portion of every Sunday. Nurses are not allowed to be out later than 9.30 p. m. or to go out evenings without the permission of the superintendent of the training school.

The applicant has also to answer the following questions:

1. Name in full and present address.
2. Are you single or a widow?
3. Age last birthday, date and place of birth.
4. Are you strong and healthy? And have you always been so?
5. Are your sight and hearing perfect?
6. Have you any disease of the lungs or any uterine trouble of any kind?
7. Have you any physical defects?
8. Have you read and do you clearly understand these regulations?

The demand for these nursery maids far exceeds the supply, and there is always a waiting list of ladies who desire these maids. The pupils are from the upper servant class and have this ranking in the household. On the satisfactory completion of six months in St. Margaret's, they are sent to private families, and if they perform satisfactory service are given a diploma at the end of the eighth month. The salary for the first year is $25 a month, and the hospital will not permit the giving of a larger amount. The following information circular is sent to the employer of each nursery maid, so that there will be no misunderstanding as to the duties and privileges of the nurse:

The nurses must wear the complete blue uniform in the house at all times.

They take entire charge of an infant, or one small child, night and day, washing napkins and small flannel pieces, but they do not do their own nor any other laundry work.

They take care of the nursery and own room, and do the mending in so far as they are able.

Time off duty: One afternoon and evening every other week, intervening Sunday evening, and time on Sunday to attend one church service.

They are competent to meet any simple nursery emergency, but are not allowed to give medicine or in any way to prescribe for a baby without a physician's orders.

For the first year after graduation they receive $25 per month, $30 for more than one child.

The nurses are to be called by their Christian names, and are to be treated as the other maids in the house; they are also expected to use the back door.

It is customary to send railroad fare for graduates who go out of town.

Although not obligatory, it is the custom for any one securing a nurse from St. Margaret's to send $5 in appreciation of the service.

In case the nurse is not desired, this money is not refunded without a week's notice.

The advantage to St. Margaret's of this training school has been very great. It trains an adequate number of nurses who take great interest and pride in their work. It permits more personal attention and provides one nurse for each four babies. These nurses become very fond of their little charges, and the babies receive a certain amount of "mothering" that is excellent for them. The babies need a certain amount of affection and care which is best expressed by the term "mothering," and this should be encouraged. The course of instruction is as follows:

1. Infant feeding: The care of milk; milk sterilization; care of bottles; preparation of food, with rules as to quantity and frequency.
2. Bathing: Daily bath; the use of hot, cold, bran, and mustard baths.
3. Hygiene of skin, care of mouth, eyes, ears, and nose.
4. Nursery hygiene: Ventilation, temperature, cleanliness, care of napkins, etc.
5. Training of children in proper bodily habits.
6. Miscellaneous: Use of clinical thermometer, making of poultices, giving of enemata, gavage feeding.
7. Simple means of treatment in nursery emergencies.
8. The rudiments of kindergarten work.

The recitations and demonstrations are given by the superintendent, who uses the little handbook of Dr. Holt's on "The care and feeding of infants" as a textbook.

St. Margaret's House illustrates what can be done in a modest but effectual way to reduce the mortality in infant institutions. There are a large number of babies in every community who require hospital or institutional care. These babies thrive much better and are more intelligently cared for in separate and distinct institutions. The babies' ward in a general hospital or in a children's hospital is not so productive of good results.

DISCUSSION.

By Dr. Hastings H. Hart: The statistics presented by Dr. Shaw exhibit the distressing fact that, while there has been a remarkable diminution of infant mortality in the general population, the institutions for infants have not shared in this reduction, but show an actual increase, notwithstanding the fact that they have medical staff and trained caretakers.

An excellent baby-saving show was held in Albany in November, 1910.

L. T. Royster, M. D., Norfolk, Va.: One of the greatest causes of mortality in baby institutions is the fact that there are too few nurses and attendants for the number of babies. Most institutions have 1 nurse for 10 babies. Five is as many as they can attend to properly Increase the number of nurses and attendants and the mortality will come down.

Dr. Henry L. K. Shaw, Albany: The milk in St. Margaret's is not pasteurized because we know the source of the milk, and are confident of its cleanliness. Pasteurization is therefore unnecessary. Several years ago we pasteurized the milk of one-half of the babies, and became convinced that, on the average, the babies fed on raw milk thrived better than those fed on heated milk.

THE FOUNDLING.

Homer Folks, Secretary, New York State Charities Aid Association, New York City.

The prime necessity, in any consideration of the subject of foundlings, is to bear clearly in mind that there are real foundlings, and that there are so-called foundlings, who are not actually foundlings at all. The foundling is a child who has been actually abandoned in a street, hallway, park, field, or other public place, of whose parentage nothing is, or is likely to be, known, and as to whose parents there is, therefore, no opportunity either for friendly conference or for legal proceedings. The pseudo-foundling, on the other hand, is a child who is taken by his parents or relatives to a so-called charitable institution, sometimes miscalled a foundling asylum or foundling hospital, and turned over permanently to that institution, ordinarily under pledge of secrecy, with the understanding that it can not be reclaimed, and that its whereabouts will not be known to the parent. There is a vital difference between these two events. The real foundling is thrust upon us; the so-called foundling we achieve by our voluntary action. For the real foundling our responsibility as a community and as charitable agencies is, at most, indirect and remote. For the so-called foundling our responsibility is direct, complete, and unescapable. We take him from his parents with our eyes wide open, deliberately, and with full knowledge of what we are doing.

The number of actual foundlings is, as compared with the number of so-called foundlings, a negligible quantity. The number of actual foundlings in a few of the larger cities of this country, in 1911, as reported by the police departments, is as follows: New York, 138; Chicago, 38; Boston, 5; Baltimore, 8; Buffalo, 6; Washington, 5.

It is not my purpose to discuss at length the methods of caring for real foundlings. The subject is comparatively unimportant. The methods have been clearly worked out, and conclusions may be stated somewhat dogmatically without fear of successful contradiction. Real foundlings are not, in the great majority of cases, in a moribund condition when found. The great majority of them are not seriously diseased, nor seriously lacking in vitality. If kept at a central reception station only long enough for careful examination; if those suited therefor are immediately thereafter placed with a wet nurse, and those requiring hospital care placed under suitable conditions for receiving the individual care and treatment needed, the death rate among children who have passed through the ordeal of abandonment and exposure may nevertheless be brought down to approximately the death rate among other infants in the same locality. This has been conclusively demonstrated, in New York City, by a joint committee of the New York Association for Improving the Condition of the Poor and the State Charities Aid Association, which received and cared for one-half of the foundlings, taking them alternately, received over a period of years.

As stated above, however, the important aspect of this subject is not the real foundling, but the so-called foundling, who is not a foundling at all. If the number of real foundlings is almost negligible, the number of so-called foundlings is so large as to challenge our most serious consideration. For instance, in the city of New

York, where the number of actual foundlings last year was 138, the number of so-called foundlings was about 2,500, of whom about 2,000 were received in one institution; that is to say, for every one real foundling there are about 20 so-called foundlings.

Among these so-called foundlings the death rate remains high. All sorts of annual death rates can be prepared, but the inescapable and melancholy fact is that for a long series of years the number of deaths each year equals almost exactly one-half of the number of admissions. Put in another way, of the enormous number of children received, ranging in one institution from 2,000 to 2,500 per year, almost exactly one-half survive infancy, and almost exactly one-half find their way to the city morgue. This proportion is, of course, far in excess of the ordinary death rate among children of like age, and the mortality among this class of children alone constitutes a serious part of the total problem of infant mortality in our city, approximating 10 per cent of the total infant mortality.

It is not my purpose to discuss the ways and means by which the mortality among these infants, thus surrendered, might be reduced by more efficient methods of selecting wet nurses, of medical supervision, of more efficient hospital care for those becoming ill, and so forth. All that is apart from the underlying question which should be solved first. Is it necessary to have any such number of so-called foundlings? Let me state my opinion as briefly as possible: It is not only wholly unnecessary; it is wholly indefensible and shockingly wicked. The real and the only remedy for the situation is not to provide better care for the so-called foundling, but not to receive him into our care at all. Leave him with his mother; assist the mother, if need be, and you will thereby, in the great majority of cases, substitute breast feeding and individual home care for artificial feeding, or wet nursing after a period of artificial feeding, and you will at one sweep enormously reduce infant mortality.

The justification ordinarily advanced for the ready reception of infants from their mothers in the so-called foundling hospitals is that the babies are presumably born out of wedlock, and that if they were not received from their mothers or relatives in this manner, they would be actually abandoned by their mothers and relatives, and become real foundlings. For this assumption there is not the slightest shred of evidence. On the contrary, the facts stated at the outset of this paper, showing the number of actual foundlings in different cities in this country, controvert the assumption in the strongest possible manner. They lead to the same conclusion as figures which I collected some 20 years ago, when it was proposed to establish a so-called foundling hospital in one of our large cities, which at that time had no such institution. So far as the evidence goes, it would seem to indicate that, in those cities in which infants are most freely received from their parents, and in the largest numbers, there, also, the largest number of other infants are actually abandoned upon the streets and other places. The cities which have very large numbers of so-called foundlings have also a relatively large number of actual foundlings. The assumed underlying justification for the foundling hospital absolutely disappears on close examination.

It is, furthermore, claimed that if the so-called foundling hospitals did not receive large numbers of supposedly illegitimate infants under pledge of secrecy, the horrible practices of infanticide and abortion would be increased. So far as I am aware, it is impossible to adduce any evidence having any conclusive and direct bearing upon this subject. No one with any knowledge of the facts would claim for a moment that the existence of foundling asylums receiving children readily has eliminated, or nearly eliminated, the practices referred to. I have heard of but one city in which collusion between the authorities and the abortionists became a matter of public discussion and a political scandal; that happened to be the city in which the doors of the foundling hospital are open very, very wide. It is my best judgment that, whether or not there be a foundling hospital has very little, if anything, to do with the prevalence or absence of abortion and infanticide. In any event, it can not be too strongly said that no evidence has been or can be adduced, except bold assertion, in justification of a so-called foundling hospital as a means of preventing abortion, infanticide, or abandonment of infants. On the other hand, the lamentable fact stands out everywhere that among the so-called foundlings the death rate is abnormally high. It is hard to overemphasize the responsibility resting upon those who stand for this policy.

As a result of some thought on the subject, I have reached a definite conclusion as to the remedy. The abandonment of a child by its mother at the doors of the so-called foundling hospital is not, in its essential aspect, very different from its abandonment in a railway station or street. In either case the child is likely to receive care and attention; in neither case will it be its mother's care. Now, the abandonment of a child by its mother in a railway station or a street, or any such public place, is a crime. Its abandonment at the door of a foundling hospital, in my judgment, is equally in ethics a crime, and should be made such by statute. It is a matter of public concern. Granted that there are exceptional cases in which a mother may be unable, for physical reasons, or for reasons of moral unfitness, to care for her child, this determination should be made only by duly authorized representatives of the people, and it should never turn on the bare question of whether or not the child is born out of wedlock. Of the 2,000 to 2,500 infants given over each year by their mothers to the so-called foundling asylums in the city of New York there is, in my opinion, no conceivable doubt that 90 per cent or thereabouts should, under no circumstances, have been separated from their mothers. Only by preventing such separation, by force of law, if need be, can we deal intelligently and successfully with the problem of the so-called foundling.

DISCUSSION OF THE BABY-SAVING SHOW HELD IN PHILADELPHIA IN MAY, 1912.

Dr. Samuel McC. Hamill, Professor of Pediatrics, Philadelphia Polyclinic, Philadelphia, Pa.

Mr. Homer Folks, in opening the sessions of a conference on infant hygiene which was held in Philadelphia in connection with our baby-saving show, so aptly expressed our reasons for the selection of the title "Baby-saving show" that I shall take the liberty of quoting his remarks. He said:

> I was highly pleased to see that you gave yourselves the title, "Baby-saving show," which the New York Evening Post has referred to as "undignified, but very happy." All my experience indicates that there is a great difference between infants and babies. We usually talk about infants and infant mortality. I think you are very much wiser in talking about babies and in giving the babies a show. The difference between infants and babies is the difference between the vernacular and the academic, between the interesting and the uninteresting. There are exceptional men who would perhaps risk their lives to save an infant, but there is no man who would not instantly risk his life to save a baby. It seems natural that some dignified infants should die, pity though it be, but the death of a baby is always tragic, and always enlists our sympathy to the utmost degree. I was glad to be invited to a show, not an exposition, nor an exhibition, nor any other learned affair. People like to go to a show, but must be wheedled into going to an exhibition. I was also glad that the babies were not to be conserved or protected, but just merely saved—the good old short word. Everybody understands what saving babies is—I am perfectly sure that the appeal for saving babies would be irresistible and that a municipal organization to save babies could always get adequate support.

So much for the title.

Why was such a show held? Because babies need to be saved. The enormous death rate of the first year of life has been recognized for many years. The causes, the cure, and the prevention of the diseases which produce it have been studied exhaustively, and we have learned therefrom that by means of curative measures alone but little impression can be made upon the high mortality of infancy.

It has been a gradual evolution that has separated us from the medieval idea that all diseases could be cured by drugs and potions, provided such remedies were administered by someone of supernatural ability. As we learned, more or less empirically, to recognize the limitations of drugs and to better understand the power of the human body to defend itself against disease, we were stimulated to study more carefully the composition of drugs and their action upon the functions of the body. This has resulted in the elimination of most of those which are devoid of therapeutic value, so that to-day the drug treatment of disease is limited largely to the application of drugs of known physiological action for the relief of disturbances of function in which such physiological action is definitely indicated.

It was but a short and natural step from a recognition of the limitation of drugs in the treatment of disease to a consideration of its prevention. In order to prevent disease, it was necessary to know its causes. The study of the causation of disease—world-wide and extending through many years—has furnished one of the most interesting chapters in medicine. It first took into consideration the relationship of diseased conditions to the events that had immediately preceded them. It proved an easy matter to establish an association between various factors and the subsequent disease, such, for instance, as the exposure to cold and the subsequent pneumonia. In the clinical study of cases the history of such exposure was exceedingly common, and aside from this pneumonia was more prevalent during the season of the year in which such exposure was possible. But this did not explain the processes which took place in the victims of pneumonia which caused them to succumb to an exposure which had no detrimental influence upon other individuals. Manifestly there was something lacking in this theory of the causation of pneumonia.

What was true of pneumonia was true also of many other conditions. Additional information was necessary, and the search for it was continued. All departments of medicine have been occupied to this end, but it has been chiefly through laboratory investigations that we have accumulated the information that has given us some foundation for the establishment of preventive measures.

The discovery of the germ origin of disease was the first great stimulus. This determined not only that in certain diseases there is a definite factor responsible for their production, but it opened up an entirely new field for investigation. It was not sufficient to know the bare fact that germs produced disease, but also the origin of such organisms, their viability outside of the body, the media in which they lived and grew, the avenues through which they were conveyed to their victims, their action upon the human body, and the way in which man protected himself against them, or, if infected, by what processes the infection was overcome, and, finally, what therapeutic measures could be evolved to protect against or cure such infections.

The study of the cause of disease, however, has not been limited to the work of the biologist. There are many diseases that are not due to microorganisms. Much new and valuable knowledge which has a very direct bearing upon the cause of disease has been contributed in the past several years by the physiological and chemical studies of the functions of the various organs of the body.

Out of all of these investigations in the field of biology, chemistry, and physiology we have accumulated a fund of knowledge which has been of inestimable value in our unending struggle against disease. All of our modern sanitary procedure is based upon the results of such work. For many years we have recognized an element of danger in filth conditions, in overcrowding, in defective ventilation, in vermin, in insects, especially the biting kind, but it was not until modern research pointed out to us the effect of overcrowding and bad ventilation upon the individual's resistance to disease, the relationship of filth conditions to the breeding of insects, the existence in vermin and insects of the diseases which attack mankind, and the ability of these creatures to transmit them to men, that we understood their true relationship to disease.

This recently acquired knowledge has enabled us to see that much of the disease to which mankind is subject can be prevented by the establishment of proper preventive measures. No more striking illustration of the truth of this statement can be given than the results of the noble efforts of the officers of the United States Government in the Panama Canal Zone. A comparatively few years ago, but before the discoveries of modern medicine, an attempt was made to construct a canal across the Isthmus of Panama. The project was eventually abandoned, mainly on account of inability to cope with the environmental conditions, which caused such widespread disease and death among the laborers that were employed in the work of construction. The United States Government entered this same district—one of the most unhealthful in the known world a few years ago—armed with a knowledge of the origin of the diseases which infested it and the methods of combating them. Under absolute military control, not only has the work of this vast project been almost completed but this formerly impossible district has been transformed into one of the most healthful regions of the world. What has been done in Panama and elsewhere under military law is possible of repetition in any part of the world. Unfortunately for mankind military control can not be universally adopted, and instead of demanding the cooperation of the inhabitants of the countries and cities of the world this must be secured by other means.

If the knowledge possessed by those who are educated in medicine and sanitation, as, for instance, the members of this great congress, was shared by all mankind, the health problems that confront the governments of the world would be immeasurably simplified; but such knowledge, unfortunately, is restricted to a relatively small group, and it is this very ignorance that not only stands in the way of rapid progress in the control of disease and its mortality, but actually causes the great bulk of it.

There is no age period in which the number of deaths is greater than during the first year of life and none in which the number of preventable deaths is so great. It is also true that this high mortality is chiefly amongst those who are most ignorant. It is very manifest, therefore, that if much impression is to be made upon the mortality as well as the morbidity of this first year of life some means must be adopted by which this class of people can be taught to understand the danger of their environment and of their present methods of living, as well as to appreciate the value of the preventive measures which intelligent health officers are endeavoring to enforce.

How is such education to be administered? Ignorance of and indifference toward health measures are as old as man. To overcome this long-standing ignorance and prejudice in the shortest possible time is no sinecure. Large and widely different groups of people must be taught, and the lessons must be presented in such form as to interest and appeal to the intelligence of them all. The ignorant foreigner, who may not even understand our language or be able to read his own, must be enlightened. The children of the foreign born, who acquire the English language and adopt the American ideas more quickly than their parents, must be used not only as interpreters but also as teachers. They must be taught that they may teach. This is also true of the children of the native born, for in many of the families of the poor the older children are the acting mothers, the ones upon whom falls the responsibility of caring for the babies of the household.

Education must not be limited to the mothers and sisters of the family, however. The fathers must be made to understand what is needed for the safeguarding of their babies' lives. This phase of educational work has been entirely neglected or left to be imparted at second hand by wives and children. Without this knowledge, the cooperation of the head of the household, which is absolutely essential, will be lost, and much of the effort expended in teaching the wives and children will go for naught.

Education must extend also to the more enlightened element of the community. While it is true that relatively few of the infant deaths occur among this latter class, it must be remembered that even here there is a very unnecessary waste. This must be prevented, and, at the same time, the educated classes must be made to realize the enormity of the infant death rate among the poor, the conditions which cause it, and the possibility of its control—yes, even more, they must be made to earnestly cooperate in the struggle to end this unnecessary slaughter of the innocents.

The ignorance of many of the educated, if one may use a paradox, and their attitude toward the problem of baby saving, is incomprehensible. Whilst making personal appeals for funds to finance this Baby Saving Show, one of the most cultivated men of my acquaintance seriously argued with me that the present-day city must be looked upon as a place for children to die in—as little better than a morgue. This is only one of several viewpoints that were equally remarkable. The minds of such men must be cleared. They must be brought face to face with the living problem; they must see things as they are, so that they may understand why they should not be.

What are we doing to educate these widely divergent groups of people? How, for instance, are we telling the educated and comfortably situated in life how the other half lives, of the morbidity and mortality of their children, of the causes that produce these results, and the possibility of their prevention? Occasional items appear in the public press, occasional articles are published in weekly or monthly magazines, occasional lectures are delivered, and occasionally health boards issue health pamphlets. Doubtless these documents are read by some, remembered for a time, and then forgotten. I question very much whether the newspaper and magazine articles as much as compensate for the baneful influences of the beautifully illustrated and richly promising patent food and drug advertisements which these same publications contain. Only a small minority can be reached in this way. The problem of educating the educated is still far from being solved.

Federal, State, and municipal governments are studying the problem of baby saving; charitable institutions and organizations are adding their efforts; and great international congresses are being held in the interest of the lives of the babies. The educated public knows that something is going on—perhaps that the lives of babies are under consideration—but they do not get from such activities an intimate knowledge of the facts which they must know before we can hope to have their active cooperation in working out this great problem of baby saving.

For the other class—the ignorant poor—much more direct work is being done. Printed instructions upon the care of the baby and on general matters of hygiene, easy of comprehension, and in the necessary languages, are being distributed. What is of more importance, municipalities are establishing departments of child hygiene, which have their milk stations and various other educational centers, and their corps of social workers and visiting nurses who carry the desired knowledge directly into the home. Social organizations are establishing educational settlements in the densely populated and poverty-stricken districts of our cities, and conducting many other activities, the purpose of which is to establish right methods of living.

Relatively recently, educational exhibits have come into vogue, and our limited experience of them has clearly shown that they must be reckoned among, if not considered, the most efficient means at our disposal for the dissemination of knowledge and the stimulation of public opinion. The very remarkable international tuberculosis exhibition held in this city (Washington) a few years ago, and that most wonderful health exhibition in Dresden last year, carried knowledge of the causes, ravages, and methods of prevention of the great white plague and all other preventable diseases to hundreds of thousands of individuals who would not have obtained such information in years through the avenues previously described.

Such exhibitions convey knowledge through the medium of both the eye and the ear, and as Prof. Adami has well said:

> It is a principle absolutely established in teaching that facts, when reaching the brain through the one channel of either hearing or seeing a written page, do not impress the mind or become fixed therein with the same sureness as when both ear and eye are employed, or when not the written statement or description, but the facts themselves, are actually brought within the experience of the observer, or when, in place of abstract figures, descriptive pictures or illustrative diagrams are employed. The graphic representation of a condition is very much more impressive than any amount of reading or study of columns of figures.

It was because of our belief in this method of impressing the minds of communities that we organized a baby-saving show in Philadelphia. As you will observe from its title, it was not a child-welfare exhibit, but merely a baby-saving show. We restricted our efforts to this particular period of life because we wished to impress upon the minds of the Philadelphia public the enormous mortality at this age period and the possibility of its prevention, and we chose the month of May, as it immediately preceded the time of the year in which the preventable infant deaths are most common.

It is manifestly impossible to give a detailed description of this extensive exhibition in the limits of a short paper. I shall, therefore, consider a few of those features which seemed to us to be of special interest.

DURATION OF SHOW.

It was determined to hold the show for a period of nine days in the central portion of the city, and, later, for periods of four days in each of four of the thickly populated portions of the city. The subsidiary shows were given for the benefit of those who could not afford the time nor the money to go to the central portion of the city. These subsidiary shows were probably a mistake. The exhibits could not be moved in their entirety; they had to be quickly transported and quickly put into place; the exhibition rooms were inadequate; the arrangement of the exhibits was less attractive and less effective; the conduct of the exhibit was more difficult; intelligent demonstration was lacking; and, judging from the size and character of the attendance upon the main show, it is probable that a larger group of people could have been reached and more good accomplished had the show been continued for another week in the central location.

COST OF THE SHOW.

The total amount of money expended in the preparation, the conduct, the taking down and transporting of the exhibit, and the publication of an illustrated report will amount to $14,300, which, for a show of its magnitude, and in the light of the fact that it was transported to four widely separated points, seems a very remarkable showing.

METHOD OF FINANCING THE SHOW.

Practically this entire sum was underwritten by a group of public-spirited private citizens who guaranteed amounts varying from $100 to $200 before any public appeal for funds was made. An appropriation of $5,000 by the city government, together with the general subscriptions, will enable us to return to the guarantors about 40 per cent of their guarantees.

SELECTION OF EXHIBITION HALL.

For the housing of the initial exhibit we selected the most attractive centrally located exhibition hall in the city, because we believed there was much educational value in a setting that would provide adequate light, space, ventilation, and cleanliness, and make possible simplicity and beauty of arrangement of the exhibits.

COLOR SCHEME FOR CHARTS, PHOTOGRAPHS, AND BACKGROUNDS.

Before the preparation of the exhibit was begun we determined upon a uniform color scheme for the backgrounds and mountings of the charts and photographs as well as a uniform method of lettering which would be attractive and at the same time restful to the eye. The backgrounds were of a light sage green and the charts of an ivy green, and the lettering in white, of uniform size, and large enough to be read from a distance.

THE LEGENDS.

Realizing the discouraging effect of long legends and overfull descriptions we insisted upon short legends, clearly, concisely, and directly expressed—the presentation of a small number of salient points expressed in the most emphatic way—rather than to risk fatiguing the visiting public by setting forth in charts everything known of the various activities employed in baby saving. We also eliminated intricate statistical charts as a feature of the show. For the benefit of those who desired to study them, we exhibited a few admirably prepared statistical charts secured from the Bureau of the Census, the United States Department of Commerce and Labor, the Department of Health of the State of Pennsylvania, and the Department of Vital Statistics of Philadelphia, practically all of which were graphically arranged.

OBJECT TEACHING.

Realizing also that concrete object lessons represent the most effective means of fixing facts in the minds of the people, we illustrated much of the exhibit by means of objects, some of the booths containing practically no legends.

PLAN OF EXHIBITION BUILDING.

The exhibition hall was divided as follows: On the first floor was the entrance hall to the main stairway, on either side of which there was admirable space for exhibition purposes, and in the rear of the building there was a large audience room, which was used for lectures and demonstrations. On the second floor there was, in the front of the building a large foyer, and leading from this on either side of the stairway, were wide corridors, with more than 200 linear feet of wall space, and back of these the main hall of the building.

PLACING AND CORRELATION OF EXHIBITS.

In the entrance hall to the right of the stairway was placed the admirable exhibit of the department of health of the State of Pennsylvania, and to the left the statistical exhibit of the United States Bureau of the Census. The corridors of the second floor accommodated the loan exhibits of the various charitable organizations of Philadelphia and other cities. In the main hall of the second floor was placed the main exhibition, which was created by the committee having the show in charge. It was in this hall that the relationship of the exhibits to each other and the order of their sequence were given the fullest consideration. The crowds that entered the hall were required to follow a one-way arrow, which compelled them to study the sections in the following sequence: First, heredity and eugenics; second, housing and environment; third, the care of the mother during pregnancy and the lying-in; fourth, the care of the newborn;

fifth, breast feeding; sixth, the relative value of milk and the proprietary foods; seventh, the production and handling of milk and the care of milk in the home; eighth, the substitute feeding of infants; and, ninth, the care of the baby, its clothing, bathing, exercise, hours of sleep, etc. In other words, each visitor to the show had impressed upon him, first of all, prenatal influences which affect the morbidity and mortality of infant life, influences concerning which the majority knew nothing. The lessons in this department were so directly taught, and the relationship of cause to effect so clearly defined, that no one of ordinary intelligence could possibly fail to read them.

From this division of the subject the visitor passed on to the consideration of the postnatal influences, of many of which he had heard, but concerning which he was here to learn more.

SEPARATION OF THE EXHIBITS OF PROPER AND IMPROPER METHODS.

There was one feature in the general arrangement which we found of great value, and that was the separation of the exhibits of incorrect and detrimental methods and equipment from those which were correct and helpful. We had found by experience in other exhibitions that where the good and the bad were placed side by side the illiterate classes had sometimes carried away and put into practice incorrect methods, assuming that anything which had been observed in the exhibition was worthy of imitation. The only studies in contrasts which were approved were those between good and bad dairy barns, illustrated by models, the right and wrong way of caring for milk in the home, and a good and bad living room. These latter were reproductions of a dirty, dilapidated room, which was transformed into a clean, attractive room by the expenditure of $2.87, plus a little muscular effort on the part of the occupants, and a stirring up by the visiting nurse of the landlord and the city authorities to the point of carrying out the sanitary measures which they were legally bound to effect.

BOOTH CONTAINING THINGS BAD FOR BABIES.

The undesirable things were shown in the foyer, which was in the front of the building and separated from the main hall by the corridors, and over the entrance of which hung the lengend, "Things which are bad for the baby." This arrangement, aside from preventing confusion, enabled us to broaden the scope of this phase of the exhibition. In this booth were shown rooms with defective ventilation, untidy, illy furnished, and overcrowded; baby pacifiers; improper feeding bottles and nipples; injurious secret nostrums and patent medicines; incorrect methods of bathing, holding, and feeding babies; the bad effects of strong lights upon the eyes, etc.

SECTION ON BREAST FEEDING.

Especial effort was made to lay stress upon the importance of breast feeding. The booth devoted to this subject was one of the most artistically and attractively arranged in the entire exhibit. It contained, amongst other things, some admirable photographs illustrating the proper method of holding the baby during nursing, an advergraph, an electrically operated instrument that displayed successively a series of valuable legends relating to breast feeding, and an exquisite color drawing of a mother nursing her baby. A perfect reproduction of this drawing, on the reverse side of which were printed proper instructions for breast feeding, was freely distributed from this booth by an attractive, intelligent nurse in uniform.

SECTION ON HEREDITARY SYPHILIS.

Another most successful section was the one relating to hereditary syphilis. This was the first exhibit approached upon entering the main hall. The first charts defined in delicately framed but unmistakable language the most common method of conveying syphilis. Beside this was a chart defining the Wasserman reaction in simple language, and, for the purpose of attracting the eye, in the center of this chart was placed a series of tubes illustrating the reaction. Beside this were charts pointing out the length of duration of syphilis, especially of inadequately treated syphilis, the certainty of its transmission to the offspring, and the importance of the blood test for those who had had syphilis, especially those who contemplated matrimony. The balance of the exhibit consisted of colored drawings of the lesions of congenital syphilis, each drawing bearing a descriptive legend.

A boldly illustrated public exhibit of syphilis was entirely new to the city of Philadelphia, and its effect upon the public mind was observed with very great interest by the committee. It was previously planned that this exhibit should be very carefully and at the same time clearly demonstrated, and that no misinterpretation of its purpose should be imparted to the mind of any of the youthful visitors to the exhibit. There was no part of the show that was studied more thoughtfully and apparently none that made a deeper impression.

As an illustration of this, one of a number of instances may be described. A young man was observed to approach the exhibit and carefully study it in every detail. He was apparently much impressed and agitated by its teachings. He immediately sought out a member of the committee, to whom he confessed that he had had syphilis, that he had been married within a year, and that his wife was pregnant; and he desired to know if there was anything which he could do to protect his prospective offspring from the possibility of congenital syphilis. It is reasonable to assume that this lesson, which was probably learned too late by this young man, was impressed upon the minds of many of the thousands of young people who had the opportunity of studying it. Many illustrations of this character could be related in regard to every one of the exhibits.

DEMONSTRATORS.

Experience in other exhibitions held in Philadelphia had impressed upon the committee of the baby-saving show the importance of having enough demonstrators to explain the exhibits to everyone that entered the exhibition building. Consequently, permanent demonstrators were placed in practically every booth. These demonstrators were thoroughly conversant with the lessons the committee desired to have imparted. In addition to these special demonstrators, there was an adequate group of carefully selected demonstrating guides composed of young physicians and advanced medical students who were conversant with the general purposes of the exhibitions and who piloted individuals or groups of individuals throughout the entire exhibit. Besides these demonstrators there were always present in the building a number of members of the committee, who not only volunteered their services as demonstrators but to whom anyone desiring special information was referred.

There has probably been no exhibition in America in which the demonstration of the exhibits was more satisfactorily conducted, and none, therefore, we believe, in which the lessons intended to be taught were more clearly imparted.

NUMBER AND PERSONNEL OF THE VISITORS.

In the nine days in which the show was given in Horticultural Hall it was visited by 67,000 persons. Children of 12 years and younger were not admitted unless accompanied by their parents or guardians, and no children or youths were permitted to wander through the exhibit unattended. The personnel of the visitors, however, included a very large group of little mothers whose attention was especially centered upon the portions of the exhibit which bore most directly upon the care of the baby. Of the total number of visitors, the majority was unquestionably made up of prospective mothers and mothers with infants. One of the demonstrators in a booth devoted to the clothing of the baby was consulted by more than a thousand pregnant women, and during a single hour on one day 200 women with babies in their arms entered the hall. On this particular day there were admitted 1,200 mothers with babes in arms.

The number of fathers who came to get information for mothers who could not come was striking. Many of them came with pencil and paper to make notes of the things they wished to remember.

An interesting feature was the large attendance of the well to do and rich, and it was very gratifying to see many of these return a second and a third time, selecting hours during which the attendance was smallest, in order that they might study the exhibits thoroughly. The attraction of this class of individuals was one of the most important developments of the show, in that, in the sections bearing upon heredity, eugenics, and housing conditions, many of them gained their first knowledge of the dangers which surround the offspring of the poor and ignorant inhabitants of our cities—a very important lesson for them to have learned, since the support of this element of the public is very essential to the carrying out of public-health measures.

The show was very largely attended and carefully studied by active social workers and philanthropists, not only from Philadelphia, but also from other cities, thus extending its educational value beyond the confines of a single city.

As a supplement to the exhibition, and with a view to broadening the scope of our educational work, four short lectures were delivered in the lecture hall on the first floor of the building each day, two in the afternoon, and two in the evening. All of these lectures related directly or indirectly to the subject of baby saving, and they were delivered by men and women from various parts of the country who were especially conversant with the topics assigned them. Immediately before and immediately after each series of lectures, and again at midday, several educational moving pictures were shown. In no way was the desire of the public to learn better illustrated than in the attendance upon these lectures and demonstrations. The room, which had a seating capacity of nearly 300, was overtaxed at practically every session, and the audiences were always attentive and alert.

The lectures and demonstrations were continued during the course of the subsidiary shows, and were marked by the same characteristics.

During the week of the main exhibit, and with a view to interesting social workers and all others intelligently interested in the problem of baby saving, there was held a conference on infant hygiene, the contributions to which were made almost exclusively by especially chosen individuals from other cities. The transactions of this conference, which are to be published in the report of the show, illustrate its scope and value better than any description which I might give.

There are three additional points to which I wish to refer in closing: They are the babies' rest room, the character of the literature distributed, and the absence of a commercial exhibit.

Realizing that many babies would be brought to the show, we felt it incumbent upon us to make some provision for their care. For this purpose a room in the rear of the first floor, adjacent to a toilet, was equipped with cribs and all other necessary articles. The room was presided over by two trained nurses and a resident physician. Sanitary diapers were provided and absolute cleanliness was insisted upon. Mothers were taught the value of care and cleanliness, both by example and by word of mouth. Unfortunately the capacity of the room was overtaxed, but many valuable lessons were taught there, and the committee learned the importance of adequately providing for the care of babies during exhibits of this character.

As to the literature, but two official documents were distributed; one the colored drawing already referred to, and the other a booklet entitled "the care of the baby." This latter was a very carefully and attractively prepared document which contained all the information a mother would need for the proper safeguarding of the baby, expressed in simple, direct language. The distribution of many tracts and pamphlets was proscribed, because experience in other exhibitions had taught us that the essential lessons were often lost in a multiplicity of documents.

No one who has not experienced it can appreciate the relief that comes from the absence of a commercial exhibit. Commercial exhibits bring a revenue, but nothing else of value, and the revenues from rented space are offset a thousandfold by the noise and clatter, the barking of wares, the misleading statements, and the clouding of the mind of those who come to learn. Professional exhibitors are versed in the art of demonstrating; they know how to touch the sympathetic chord and are proficient in the art of promising more than they can give. They lure the crowd and center the attention upon what they have, and the real exhibition, which is of some value, gets no show. We recommend to all those who contemplate the formulation of exhibits the elimination of the commercial exhibitor.

It is a very difficult matter to measure the effect of exhibitions. It is reasonable to assume that a fair percentage of those who come to learn will carry some lessons away with them, and that, in many instances, they will either directly or indirectly impart them to others. In the light of these probabilities it would seem that the influence for good should be far-reaching.

It is too soon to know the effect of this Baby Saving Show, but a study of the infant mortality of the city for a comparison with that of other cities, and an inquiry amongst physicians, social workers, and visiting nurses is being made at the present time to see if any data can be secured which will justify the hope that we have done much for the saving of babies in the city of Philadelphia.

DISCUSSION.

Dr. P. M. Hall, of Minneapolis, Minn.: If I understand Dr. Woods's inquiry it was, Has any State passed a law requiring a mother to nurse her baby. Such a bill was proposed before the Minnesota State Legislature, but it failed of passage.

Dr. T. M. Koon, Grand Rapids, Mich.: We have a death rate of 10 per cent in Blodgett Children's Home at Grand Rapids, which we attribute largely to employment of wet nurses for infants.

We receive illegitimate babies and those with one or other parent dead. We feel that it is better for the home to take the illegitimate babies, and later adopt them into good homes, than to leave them with the mothers.

Dr. D. M. Totman, Syracuse, N. Y.: The nurses connected with the health department of the city of Syracuse made visits to 165 newborn babies whose births had been reported. Of these 72 per cent were cared for by physicians and 28 per cent by midwives.

The preventive treatment for ophthalmia was used in 98 per cent of the cases, and the eyes were in a healthy condition except in the 2 per cent in which this preventive was not used. Ninety-seven per cent were found to be breast fed. The nurses made several visits to each baby and assisted and educated the mother in bathing and caring for her baby. These visits were made during the months of July and August, and no deaths were reported among these babies during that time.

L'ÉCOLE DE L'AVENIR.

M. A. Augustin Rey, Architecte, Paris, France.

L'espoir d'une nation est dans la jeunesse du pays. Or celle-ci passe aujourd'hui tout entière par l'école. Ce stage obligatoire et nécessaire doit être, avant tout, profitable à la santé physique de l'enfant.

Primo vivere . . . et ensuite s'instruire.

L'école doit être une pépinière d'enfants sains et bien portants. C'est à ce prix seulement qu'on prépare des races fortes; c'est par l'hygiène bien comprise, et bien apprise à l'école, qu'on triomphera des terribles fléaux sociaux qui étreignent l'humanité et dont le plus cruel de tous est la tuberculose.

Selon le mot profond de Pasteur: " Pour sauver une race menacée par une maladie contagieuse, le mieux est de préserver la graine." Envisager ainsi la question de la tuberculose, c'est poser toute la question de l'hygiène scolaire.

La plante humaine a besoin avant tout de soleil et d'air. Pour grandir et se fortifier *l'enfant doit*, *à l'école même*, *être tenu*, pour

ainsi dire, *dans un bain continuel de lumière et d'air; il n'y a d'air pur que celui qui a passé sous les effluves des rayons du soleil.*

Le soleil luit pour tout le monde et il est d'une souveraine équité de faire bénéficier de ses bienfaits l'humanité entière.

On commence, enfin, à comprendre l'importance capitale, l'action toute puissante des rayons solaires sur la santé; on se rend compte du rôle primordial et multiple des manifestations lumineuses du soleil. *L'importance de l'action microbicide et purificatrice des rayons ultra-violets du spectre solaire est, à notre avis, la découverte fondamentale de l'hygiène moderne.*

La lumière et l'air sont les bases de la vie, les éléments sans l'abondance desquels il n'y a pas de santé pour l'être humain. Lorsqu'il s'agit de déterminer dans leurs moindres détails les programmes de construction des bâtiments scolaires, ces deux éléments doivent primer tous les autres.

On peut dire qu'une véritable révolution s'accomplit à cet égard, à l'heure actuelle, dans les habitudes d'existence des différents peuples.

Les grands principes fondamentaux de l'hygiène sociale sont aujourd'hui reconnus un peu partout. Ils forment le code international de l'hygiène moderne; les climats divers, les conditions sociales différentes d'existence ne peuvent qu'en modifier le détail.

La règle générale pour les pays civilisés reste toujours. Pa même a cet égard l'utilité des Congrès Internationaux ne saurait être assez reconnue. Ils permettent, à intervalles périodiques, à chaque nation de faire le résumé des progrès réalisés par les autres peuples et de recherchèr les améliorations immédiatement applicables.

Il n'y a pas d'internationalisme plus utile à l'humanité et plus profitable à tous ses membres que celui qui se manifeste dans le domaine de Hygiène Sociale. Or, sur ce terrain, un grand mouvement se dessine déjà victorieusement pour faire profiter tous les êtres humains du droit à la vie, c'est-à-dire, du droit de l'existence dans les conditions naturelles primordiales de la santé: la pleine lumière et le plein air. Soustraire le moins possible l'organisme humain aux conditions naturelles de la vie à l'atmosphère extérieure, c'est là tout l'art de vivre longtemps conformément à la nature.

Les Congrès multiplient sans cesse les appels en faveur de cette grande cause de la santé publique. Les essais pratiques pour l'amélioration des notions de la vie, les efforts tentés en faveur de la vie en plein air notamment, restent encore trop timides. *Le mot d'ordre de cette nouvelle croisade; "Pour la lumière et pour l'air," n'est pas encore compris des gouvernements et des foules.*

Il est temps, il est grand temps, de se hâter de faire accomplir à l'humanité ce voyage sauveur de l'obscurité des villes où s'étend et s'accroît la vie de misère dûe au surpeuplement, à la vie normale en pleine lumière et au grand air. A ce prix seulement est assurée la santé de la race.

Si l'on veut aller au fond des choses, et descendre aux causes premières de la faible natalité de certaines nations, on trouvera presque toujours à *cette racine du mal* social, la funeste condition de l'habitation insalubre et *l'habitude néfaste du citadin de vivre presque enfoui dans les plis obscurs de sa maison, loin des salutaires rayons du soleil.*

Or la santé d'une race est avant tout faite de la santé des ses enfants, les hommes, les citoyens de demain. L'enfant, avant son plein dé veloppement, est une plante fragile entre toutes, dont l'existence est exposée à tous les dangers de la contamination. L'art de protéger, de fortifier, d'accroître avec des forces en croissance continuelle, la santé de l'enfant est un des plus importants problèmes qui intéresse l'avenir et le bonheur des races, la tâche la plus pressante, le devoir le plus impérieux de la société.

Comment ne pas constater que ces petits cerveaux d'écoliers qu'on remplit trop souvent et trop prématurément d'un amas indigeste de connaissances hâtives, que ces petits corps atrophiés par une mauvaise hygiène seront des organismes tout préparés à n'opposer qu'une faible résistance aux influenecs morbides.

C'est donc la construction rationnelle des bâtiments scolaires et les méthodes nouvelles qu'il convient d'appliquer qui intéressent aujourd'hui au plus haut degré la santé publique.

Dans notre civilisation moderne ou toutes les jeunes générations doivent passer par les classes, l'école exerce une influence profonde sur le développement général de la race. Il faut donc que l'école soit comme une pépiniè où la jeune plante se développe et se fortifie et non où elle l'atrophie.

Pour saisir ce que peut l'hygiène scolaire sur la santé générale d'une nation, il suffit de se reporter aux enquêtes décisives de ces dernière années. Les conséquences qu'ont, sur la vitalité d'un peuple civilsé, les conditions hygiéniques dans lesquelles est donnée l'instruction à l'enfant méritent de préoccuper et d'inquiéter l'opinion publique au plus haut point.

Le fait brutal qui domine la vie moderne dans les grands centres urbains est l'agglomération de la population; le surpeuplement va sans cesse croissant et constitue, de ce fait, un vice profond dans nos conditions d'existence.

Il ne faut pas craindre de condamner énergiquement l'insuffisance des emplacements destinés aux écoles.

L'école primaire, notamment, qui intéresse la grande majorité des enfants, et qui l'absorbe pendant ces années si précieuses où se fabrique, pour ansi dire, la santé future d'une nation doit être entourée, lors de sa création, de soins presque maternels.

Retenant l'enfant pendant cette période décisive de son développement physique, l'école devrait être toujours dégagée de toutes parts et éloignée, dans des proportions raisonnables, de tous autres bâtiments urbains, afin de voir le maximum de rayons solaires.

La racine de tout le mal qui existe dans les villes au point de vue de l'hygiène de leur population, c'est la spéculation honteuse, considérée, hélas! comme licite, dont le sol des villes est l'objet. *Cette spéculation est comme un grand crime social.*

La masse des citadins souffrent injustement, et sans le savoir souvent, des encouragements donnés par les institutions nationales et fiscales à la spéculation sur le sol des villes. Cette spéculation dans certains centres a atteint cette folie du terrain cher qui crée automatiquement la maison à étages et son agglomération invraisemblable. Elle constitue un monstrueux contre sens hygiénique et social.

Le bloc à étages se propage ainsi à l'infini avec le cortège obligatoire des cours obscures et nauséabondes, de deshonorent rues froides et sombres, qui de plus en plus la cité moderne.

La spéculation sur le terrain où s'élève et cherche à grandir la cité, voilà le chancre rongeur des grandes villes.

Si l'on ne veut pas attaquer résolument et de front ces pratiques spéculatives et chercher à appliquer les solutions qui conviennent à cette nécessité primordiale pour la collectivité du maintien du terrain urbain à bas prix, et des espaces libres qui en sont la conséquence immédiate, l'habitation saine du plus grand nombre, comme l'école salubre, deviendront des problèmes toujours plus ardus à résoudre.

Pour la population agglomérée dans les villes, qui représente dans chaque nation une proportion grandissante, il est établi par des statistiques que de mauvais bâtiments scolaires compromettent gravement la santé citadine et l'avenir de la race.

La construction de ces bâtiments a suivi, certes, d'incessantes améliorations. Certains pays ont accompli, dans ce domaine, des efforts incomparables. Sans vouloir méconnaître ceux qui ont été réalisés par de grandes villes étrangères, il est équitable, croyons-nous, dans un congrès international, de dire qu'à cet égard la ville de Paris a réalisé des progrès constants.

Mais il faut oser le dire, le programme de construction des écoles nécessite aujourd'hui de véritables transformations.

L'école doit avoir pour principal objectif, et pour premier devoir, avant tout, la santé de l'enfant.

Or qu'est-ce que l'école actuelle? Comment est-elle construite? Comment doit-on bâtir l'école de demain?

La construction de l'école doit être l'objet de grandes réformes si les administrations ne veulent pas sévèrement, mais justement, être rendues responsables de l'affaiblissement de la race.

Dès l'école, et surtout à l'école, les habitudes de vie antihygiéniques sont funestes. L'enfant des villes est laissé dans l'ignorance complète des phénomènes les plus élémentaires de la nature, et de l'action néfaste des transgressements à l'hygiène naturelle.

Cette méconnaissance déplorable de ce qu'est la mauvaise hygiène, l'oubli des lois de la nature, entraînent tout être humain, et surtout l'enfant, à des conséquences désastreuses.

Actuellement que sont les bâtiments d'école? Trop souvent de grandes casernes, à nombreux étages superposés où l'on entasse les uns sur les autres des régiments d'écoliers. On cherche à y placer le plus grand nombre possible de classes pour recevoir les élèves en nombre toujours croissant.

On rogne sur les emplacements qu'il faudrait laisser en espaces libres. On n'hésite pas à établir des préaux dans de simples cours fermées, sans communications avec de larges espaces extérieurs, et cela au hasard de terrains souvent de formes impropres au but. N'a-t-on pas vu, dans de grandes villes d'Europe, instituer des concours pour l'établissement de plans d'écoles sur de terrains aux formes les plus défectueuses! Les artifices de concurents rompus à toutes les difficultés n'arrivaient trop souvent qu'à mal les masquer. Ceci ne devrait pas avoir lieu; les plus beaux terrains municipaux devraient toujours être reservés à la construction des écoles.

Pour sauvegarder la santé des enfants à l'école, partie la plus essentielle de la santé publique, il faut, avant tout, avoir en vue d'assurer la pénétration des rayons solaires jusque dans les moindres recoins de l'édifice scolaire. *Faire entrer du ciel, le plus de ciel possible, à l'intérieur de l'école, voilà le devoir de l'Architecte.* Plus de dépenses inutiles en bâtiments énormes et en façades fastueuses faites pour le coup d'œil, pour la vanité, plus de frontispices orgueilleux, d'inscriptions flamboyantes!

L'Architecte doit résolument abandonner l'ornière de la routine où il s'est enlisé trop longtemps, ne voyant que l'aspect extérieur des choses. *Il doit se consacrer tout entier, avec le sentiment de sa haute responsabilité sociale, à l'appropriation parfaite du dedans.*

L'instrument de vie et de bonheur que doit être l'école moderne, pour le petit peuple d'enfants qui la fréquente, doit obliger aujourd'hui l'Architecte à de nouveaux et sérieux efforts.

Nous sommes encore, dans nos bâtiments, destinés au service essentiel de la vie de la cité les esclaves de vieilles formes surannées, de style, de proportions fictives, de moulurations et de décors sans signification et sans objet. Nous restons, surtout dans les centres urbains, les victimes quotidiennes d'habitudes irrationnelles d'existence. Les campagnes ont au moins l'air et l'espace si elles ne connaissent pas encore suffisamment l'hygiène de la propreté. Les petites villes, si elles ont gardé trop souvent leurs vieux quartiers aux ruelles quit n'auraient pas besoin d'être obscures, et aux habitations qui n'auraient pas besoin d'être délabrées pour rester pittoresques, ces petites villes ont du moins la nature à leurs portes. Mais les grands centres urbains sont les victimes d'un état de choses lamentable au point de vue de l'hygiène.

On a été surpris, il faut le dire, par cette vice de l'homme vers les grands centres qui a crié ce facteur essentiel de la misère, le surpeuplement. L'accroissement du nombre des habitants des grandes villes a devancé, d'une façon énorme, et l'espace et les logements disponibles. Sans doute la périphérie s'est agrandie; les faubourgs et les communes des environs, les "suburbs," comme disent les anglais, se sont étendus prodigieusement. Mais les moyens de locomotion, l'accroissement rapide et l'agencement des transports faciles multipliés et à bas prix, n'a pas suivi le plus souvent une marche correspondante aux nécessités journalières des travailleurs.

La masse de la population par ses enfants a donc souffert matériellement, non seulement dans son confort, mais surtout dans sa santé. Les classes pauvres, logées dans des bâtiments surpeuplés, sont les victimes de déplorables conditions d'éclairage et d'aération. Il est triste d'avoir à constater que dans des pays qui se disent civilisés et qui, par plus d'un côté, retournent à la barbarie il y a une lutte de plus en plus grande à soutenir pour organiser rationnellement ce qui est essentiel aux besoins vitaux de l'être humain.

L'architecture scolaire doit aujourd'hui se pénétrer de formules nouvelles, elle doit obéir à cette grande loi de l'hygiène moderne, la lumière solaire et l'air pur repandu partout. C'est donc le devoir précis de l'Architecte de nos jours d'appliquer à son tour les progrès techniques qu'on attend de son artivité, de son zèle, de son devouement, au bien être social.

Tout d'abord, pour sauvegarder à l'école la santé de l'enfant, il y a lieu, dans l'avenir, de ne plus élever de bâtiments où la seule préoccupation dominante soit de produire d'imposants effets de façades.

L'Architecte scolaire ne doit pas un instant perdre de vue la question capitale de sa tâche, qui est l'appropriation absolue du bâtiment de l'école à ces facteurs impératifs de l'hygiène: Pénétration intense des rayons lumineux, aération efficace des moindres parties de l'édifice.

Ce qu'il y a de remarquable, disons-le tout de suite, c'est qu'en *s'inspirant de ces méthodes saines et rationnelles, on n'ira pas au devant de nouvelles dépenses, bien au contraire.* Nous estimons pour notre part que la dépense faite pour la construction des écoles, est en général trop élevée et cela précisément parce qu'on sacrifie le nécessaire au superflu, la seule chose importante, les conditions hygiéniques, à des effets purement extérieurs.

Les progrès modernes dans la fabrication et l'emploi des matériaux économiques basés notamment sur la série des agglomérés qui ont rendu déjà tant de services, ne sont plus discutables. *L'école de demain, qui de plus en plus doit répondre à des conditions sévères d'économie dans l'emploi des deniers publics, devra faire une large place à ce genre de matériaux.*

L'économie ainsi réalisée dans les constructions sera employée avant tout à agrandir les terrains scolaires, à qui aura pour conséquence immédiate d'étendre davantage en surface ces bâtiments au lieu de les élever en hautuer, de respecter enfin les principes fondamentaux de leur orientation et d'aménager alentour les plantations et la verdure dont l'importance de premier ordre n'est plus à démontrer.

Le programme tient dans ces deux mots: Hygiène, économie.

La découverte qui à l'heure actuelle doit prendre le pas sur tant d'autres, est celle de l'action fondamentale exercée par les rayons obscurs ultra-violets du spectre solaire sur les organismes vivants.

Ces rayons mélangés aux sept couleurs visibles du prisme, dans une proportion énorme, puisque à eux seuls ils occupent trois fois autant d'espace que les autres, sont de nature à bouleverser tous les vieux préjugés des foules sur l'action de la lumière, et à confondre toutes les ignorances.

Les constructions humaines doivent parsuite être établies sur des bases toutes nouvelles. Lentement, mais sûrement, les conséquences s'en imposeront peu à peu dans le domaine des bâtiments de tous ordres. Dès maintenant ils peuvent être l'objet d'applications pratiques. Aucun édifice plus que l'école n'en a autant besoin.

On ne saurait en effet trop insister sur cet agent primordial de salubrité que sont les rayons solaires à la fois comme action d'éclairage pour maintenir dans les meilleures conditions d'équilibre les qualités natives de l'œil de l'élève, et comme facteur intense d'épuration microbienne de l'atmosphère de la classe comme de tout ce qu'elle contient.

La question d'éclairage domine ainsi toute la construction de l'école. La distribution des rayons lumineux passe avant l'aération, avant même le chauffage.

Il ressort des enquètes et des inspections de médecins-oculistes dans les écoles de divers pays, que la plupart d'entre elles n'ont pas été construites en vue de leur éclairage, et ont pour conséquence d'atteindre la vue de leurs élèves. *On peut presque établir comme loi qui découle de ces mauvaises installations que plus les études se prolongent sur un grand nombre d'années, plus la vue de l'élève en souffrira.* Les plus intéressantes constatations ont été faites à tous les âges des écoliers, et ont données des résultats très intéressants, suivant la latitude des villes examinées et surtout la race des écoliers. Il ne faut pas oublier en effet que la faculté visuelle de chaque race a une influence qui ne saurait étonner sur les statistiques qui ont été publiées.

Il est donc de haute importance pour l'hygiène de l'école de considérer aujourd'hui comme facteur principal, autour duquel les programmes de la construction et d'organisation des écoles modernes doivent évoluer, l'éclairage rationnel de la table de chaque élève ainsi que l'éclairage direct de toutes les parties de l'édifice.

On a beaucoup étudié la disposition des fenêtres, leur position pour l'éclairage monolatéral, qui semble, dans la plupart des cas, préférable à tout autre.

Dans la formule de surface de la fenêtre, un rapport étroit s'établit avec la hauteur, la profondeur de la classe, son orientation et son degré de dégagement d'autres édifices au-devant. *La fenêtre a toujours été considérée comme devant être nécessairement dans un plan vertical. C'est là encore une habitude, diros-nous une routine?* Lorsque l'on étudie la direction des rayons lumineux dans une classe, et à quel point il importe que la lumière pénètre surtout par la partie supérieure des ouvertures, on est logiquement amené à une nouvelle transformation. Si l'on veut atteindre à la logique scientifique, il importe de diminuer la surface du plafond de la classe en construisant les fenêtres sur plan incliné. L'inclinaison théoriquement parfaite forme un angle de 45° avec le plan horizontal. *Une fenêtre peut atteindre de cette mainère son maximum de rendement enfiltrant la totalité des rayons que présente le segment moyen allant de l'angle de 30° à l'angle de 60° sur l'horizon. Ces dispositions que nous regrettons, faute de place de n'exposer ici que très sommairement pour la première fois, conduisent au résultant inespéré du maximum d'éclairage de la classe, même par les jours les plus gris.*

L'éclairage naturel de l'école, qui à première vue semblerait si facile à obtenir, présente au contraire, dans sa solution parfaite, de nombreuses difficultés.

Il est sous l'influence directe du climat et des conditions météorologiques de chaque ville. L'usage des locaux scolaires étant de huit et dix mois de l'année, il est rationnel, avant d'arrêter le plan de ces bâtiments, de connaître quelles sont les conditions d'éclairage du lieu, le nombre moyen annuel d'heures, d'ensoleillement le nombre moyen de jours de temps couvert, de temps très couvert. Las tables météorologiques qui ont été dressées, parfois avec un soin extrême pour certains points d'Europe et d'Amérique, constituent le plus précieux instrument de travail. On doit les consulter avec grand soin lorsqu'il s'agit de créer des bâtiments quels qu'ils soient, du reste, mais surtout des bâtiments scolaires.

En généralisant les observations de ce genre, elles donneront les éléments fondamentaux du programme qu'il convient d'adopter dans chaque ville. Cet équilibre moyen qui s'établit sur une longue période d'observations, entre les jours de soleil et les jour sans soleil—définition qui répond à certaines données rigoureuses du climat d'un lieu déterminé—est nécessaire à connaître avant d'établir les plans d'une école.

Les donnés météorologiques du lieu une fois connues, il sera alors possible de déterminer la meilleure orientation pour l'éclairage des classes. La forme même des bâtiments scolaires en sera la conséquence.

Sans entrer ici dans des discussions souvent contradictoires, qui ont eu lieu pour recommender telle ou telle orientation, il faut établir qu'il est irrationnel de considérer qu'une même orientation des bâtiments scolaires peut répondre à toutes les villes d'un même pays. *Les observations météorologiques, qui comprennent non seulement l'éclairage, mais les vents, le degré hygrométrique de l'air, les pluies, les neiges, doivent être attentivement consultée.* Dans certains lieux l'exposition N. E. ou N. O. peut être recommandée, dans d'autres l'orientation peut osciller dans un angle plus étroit de 30° autour de la ligne nord sud. Une certaine marge dans ces limites permet, suivant les conditions spéciales du lieu, d'orienter au mieux les plans de l'école.

On a dit que l'action directe des rayons du soleil, que l'on reconnaît si indispensable pour la chambre d'habitation, l'était infiniment moins pour la classe où cependant les enfants passent une partie de leur jeunesse sur les bancs de l'école. Nous ne pouvons admettre de pareilles distinctions.

Le soleil, dont l'action est à la fois microbicide et désinfectante par excellence, ne doit pas avoir une action prépondérante seulement dans la chambre où loge l'enfant en famille, mais aussi dans celle où il reçoit l'enseignement.

Sans suivre les discussions sur l'éclairage unilatéral, bilatéral, ou multilatéral, ce qu'il importe c'est d'obtenir une lumière diffuse intense. Que l'on se protège pendant les heures mêmes de la classe des rayons directs solaires, est évidemment une nécessité, mais ce qu'il faut obtenir, c'est que pendant l'absence des élèves, l'action directe des rayons solaires soit suffisante pour supprimer et tuer tous germes morbides.

A cet égard l'orientation a une importance capitale.

Il importe par-dessus tout que l'école, l'école du premier âge au moins, arrive à remplir presque les conditions heureuses de la vie en plein air. C'est la vie idéale du dehors qui rend la jeunesse forte et joyeuse.

Nous sommes d'ailleurs d'avis, dans cet ordre d'idées, de donner une extension croissante aux écoles en plein air. Nous en sommes les partisans convaincus.

Nous ne prétendons pas que cela sera toujours aisé ou que dans le voisinage immédiat des grandes villes la solution sera toujours possible. Mais nous estimons que dans la belle saison, pendant trois ou quatre mois, pour le moins on doit songer à exporter les enfants en pleine campagne au moment de cette éclosion qui chaque année renouvelle la vie de la terre et dont les phénomènes analogues sont maintenant si connus chez l'enfant en croissance.

A l'époque où la nature se réveille, pendant ces mois bienfaisants du printemps où la température favorise cet exode des petits écoliers, il devient nécessaire de rechercher une solution pratique à l'école en plein air. Elle variera selon les pays, les climats, les mœurs locales, mais le moment est venu pour chaque pays de la résoudre à sa manière.

L'école en plein air n'est pas un de ses rêves utopiques, comme on a cherché à l'insinuer. Avec de la prudence, de la méthode et surtout de la patience, on peut prétendre, dans un très grand nombre de cas, l'installer avec un plein succès.

Nous avons visité maintes écoles en plein air, nous en avons vues en Amérique. Ces visites nous ont démontré à quel point cette vie libre des poumons de l'enfant dans une atmosphère continuellement renouvelrée et pure, où se jouent les rayons du soleil, est efficace pour le jeune être humain à l'époque où sa croissance reprend une activité nouvelle.

Il faudrait pour bien faire que les écoles d'hiver soient le plus souvent doublées par une installation d'écoles en plein air.

Lorsque les espaces seraient suffisants, la solution économique et rationnelle serait pour la même construction de la transformer d'école relativement close pour l'hiver, en école toute ouverte pour l'été. C'est au printemps surtout qu'il faudrait décupler, au profit des enfants, les bienfaits salutaires du soleil et de l'air pur.

L'espace et la verdure maintenus obligatoirement tout autour des bâtiments de l'école auront des conséquences capitales pour la santé des petits écoliers. Il faut arriver logiquement. et de la façon la plus pratique qu'il soit, à donner l'orientation la plus favorable aux salles d'école. S'il pouvait y avoir des locaux pour le matin et pour l'après-midi, la solution serait idéale.

Les classes du matin seraient orientées au couchant, tandis que celles de l'après-midi, avant de recevoir les enfants, auraient profité de la large pénétration des rayons solaires souverainement microbicides.

Ou bien encore, le matin serait réservé aux exercices ou aux tenues de classes en plein air, et l'après-midi les salles qui auraient reçu le soleil toute la matinée abriteraient les enfants dans les conditions hygiéniques parfaites.

Mais avant tout l'importance de l'espace et de la verdure tout alentour de l'école est capitale.

Pour l'éducation, pour la vie physique et morale de l'enfant, le jardin est indispensable. il est l'agent souverain de la santé en même temps que l'élément par excellence pour provoquer la vie heureuse des écoliers.

L'enfant des villes a ainsi l'illusion de la petite campagne, la nature lui découvre et lui raconte peu à peu ses mystères et ses secrets. Etre initié par un maître sans le ramener en classe à la vie des plantes, lui ouvre un horizon qu'aucun autre enseignement par l'image ne saurait faire. Ce point est capital pour contribuer à l'hygiène scolaire dans son acceptation la plus haute et la plus large.

Chez tout enfant il y a un petit cultivateur qui sommeille! Si on lui donne l'illusion de posséder un petit carré de terre, cet instant se réveillera. Il faut qu'il sente que ce qu'il cultive est bien à lui et qu'on ne le lui enlèvera pas. Les joies simples du plein air sont les plus fortes. Elles sont faites de l'harmonie des sentiments qui relient l'homme, l'enfant à tout ce qui vit autour de lui—lumière, eau, ciel, nuages, verdure, arbres, plantes, animaux.

L'enfant et le tas de sable, par exemple, c'est tout un poème, ce poème qu'aurait voulu vivre tout enfant.

S'amuser avec du sable permet à l'enfant les plus delicieuses créations, c'est le premier pas de l'imagination créatrice qui se développe peu à peu en mille combinaisons, en mille aventures, en recherches presque savantes.

L'enfant de cinq ans devient déjâ presque un maître dans le maniement de la matière obéissante, douce, moelleuse . . . soyeuse. Où mettre le tas de sable si ce n'est pas en plein soleil? Il faut donc de la place, et bien disposée, non pas à l'ombre de l'école, mais dans les parties le plus dégagées.

L'ignorance de l'enfant des villes est extrême en tout ce qui touche les spectacles de la nature. L'école froide avec ses classes rébarbatives et peu esthétiques n'est pas faite pour lui donner des notions des splendeurs simples et grandes qui l'environnent. Les phénomènes les plus ordinaires de la vie du ciel, des plantes, de l'air, du soleil, lui sont trop souvent inconnus. La vie des grandes villes oblitère les sens, les sentiments naturels de l'homme et fausse chez l'enfant par avance le sens réaliste de la continuité des phénomènes de la vie. La vie de l'écolier, conséquence de l'organisation scolaire et des bâtiments de l'école ne peut plus, au milieu de l'évolution générale du monde, ne pas progresser. Il faut qu'elle s'ouvre logiquement à tout ce qui permettra à l'enfant de se mouvoir, de s'ébattre, même de travailler en plein air. Il faut faciliter à l'enfant le goût de s'occuper en plein air. Cela développera avant tout sa personnalité, sa volonté.

L'importance de la vie simple, naturelle, est énorme pour la formation du caractère de l'enfant; l'influence des jeux est à cet égard considérable.

Chercher à savoir l'attitude dominante de l'enfant c'est en grande partie par la vie du dehors q'uon y parviendra.

C'est au fond tout le secret de l'éducation humaine; à tout âge on peut se découvrir des qualités qui ont longuement sommeillé en vous et qui ne se sont révélées qu'a la suite de circonstances accidentelles.

Faisons donc s'ébattre l'enfant sous le grand soleil fortifiant qui lui donner à la foie de vivre, la force de travailler et plus tard de lutter.

Un point sur lequel on n'a pas assez attiré l'attention est celui du mobilier scolaire.

Le mobilier des classes, pupitres, chaises et tabourets, doit être combiné de manière à ce que l'enfant puisse se lever quand il le veut et continuer à lire ou à écrire debout. L'habitude néfaste passée à l'état de dogme qui veut que l'écolier soit cristallisé à sa place et que plus il s'y tient immobile, mieux il est noté, est un non-sens hygiénique et une absurdité.

Elle ne fait que favoriser au nom d'une prétendue sagesse disciplinaire l'attitude vicieuse de l'écolier, qui assis d'une manière défectueuse en recueille trop souvent les funestes conséquences comme la myopie, la déviation du torse, le rachitisme.

Un membre qui ne se meut pas se paralyse progressivement. Il faut assurer le mouvement nécessaire et indispensable à tous ces petits corps en croissance. S'il leur faut du mouvement au dehors, à la récréation, il leur en faut aussi dans la classe elle-même.

C'est pour cela qu'il faut que l'écolier puisse écrire et lire aussi bien debout quand il le désire qu'assis. L'enfant sent la vie s'agiter en lui avec plus de puissance que l'homme. il faut qu'il puisse manifester cette vie dans ses mouvements, même en classe.

Et il ne serait pas superflu, loin de là, que les parents soient mis à même et en demeure de connaître les notions d'hygiène les plus essentielles, afin d'en surveiller l'observance chez leurs enfants.

L'Architecte social a en mains une parcelle importante de l'avenir hygiénique du peuple.

Pour réaliser les progrès que l'on attend de lui, il doit renouveler entièrement les vieilles formules de construction et d'art tout à fait surannés et se rendre compte des besoins intenses qui se manifestent dans les masses populaires.

Si l'agglomération, principe sur lequel les villes modernes sont fondées et qui est si contraire à l'hygiène humaine, ne peut être réformée du jour au lendemain, les efforts de tous les esprits éclairés, de tous les techniciens surtout, doivent tendre à l'amélioration constante de sa structure en vue de la rendre moins insalubre.

Le rôle de l'Architecte, s'il est celui d'être un bon constructeur qui doit assurer la solidité de l'édifice qu'il construit, et d'un artiste dans le sens élevé du mot pour le revêtir de beauté, est aussi et avant tout à notre avis celui d'être le premier hygiéniste de la cité, celui qui recherchera dans toutes les circonstances, dans quelles mesures il peut améliorer les conditions générales de la santé publique.

La caractéristique des édifices consacrés aux services généraux de la communauté doit être de remplir avant tout des conditions essentiellement hygiéniques. Il n'en seront pas pour cela des édifices laids. La beauté n'est-elle pas faite avant tout de la raison d'être d'un édifice, de ses proportions en harmonie avec ses besoins logiques?

Pour la réalisation de ce programme, surtout en ce qui concerne les bâtiments scolaires, il faut résolument prendre la pioche du démolisseur en face de ces conceptions puériles, qui consiste à dépenser l'argent des municipalités et des contribuables à créer de brillantes façades, de purs décors de théâtre. Il faut porter tout l'effort à faire concourir les moindres sommes dépensées à l'hygiène et au bien-être de ceux qui doivent habiter l'édifice.

Il y aujourd'hui, heureusement, une grande pousée en faveur de l'application de ces principes universels, qui seront le salut des nations, l'air et la lumière partout, le soleil dans toutes les demeures.

C'est en se conformant à ces règles primordiales, en se faisant le serviteur, le propagateur, l'exécuteur et l'apôtre de ces grandes lois de l'hygiène, que l'Architecte sera le bienfacteur de la cité moderne.

CONCLUSIONS.

L'école de l'avenir doit placer l'enfant, pendant toute la durée de l'enseignement, dans les conditions normales du plein air. Par sa construction et son aménagement rationnels, elle doit participer à cette évolution qui entraîne actuellement l'organisme social tout entier vers l'amélioration des conditions d'existence de la masse du peuple.

En appliquant ce programme:

1. L'école de l'avenir doit occuper des espaces de terrains assez vastes pour être de plus en plus isolée des autres bâtiments et entourée de toutes parts de verdure, dont les influences bienfaistntes sur les conditions de l'atmosphère, comme sur celles de la vie normale de l'individu, sont incontestables.

2. Dans l'école de l'avenir il faut pour la forme et l'orientation donnée à ses différents éléments, chercher, avant toute chose, à faciliter la pénétration directe des rayons solaires, et conduire, pour ainsi dire, jusque dans ses moindres recouis l'air purificateur.

3. Dans la construction de l'école de l'avenir l'économie la plus attentive doit être observée dans le choix des matériaux, leur mise en œuvre qui doit concourir l'agencement et à l'organisation pratique de l'école. Il ne s'agit plus de céder à la tentation de produire des architectures somptueuses, il s'agit de créer des formes simples, bril-

lant plus par l'habile ordonnancement des besoins hygiéniques, que par la profusion des moulures et des matériaux de luxe.

Il peut être intéressant de rappeler ici que, sur notre proposition le Congrès International d'Hygiène Scolaire de Paris, tenu en août 1910, adopta dans sa séance solennelle de clôture les vœux suivants.

Le Congrès estimant qu'un édifice peut être beau par la seule harmonie et la simplicité de ses lignes, que les bâtiments scolaires doivent être isolés et entourés de jardins.

Emet les vœux:

1. Que l'architecture scolaire réforme ses méthodes coûteuses de constructions et de décorations extérieures, les dépense devant se concentrer surtout à l'intérieur pour l'organisation rationnelle et hygienique de l'école.

2. Que toute école soit construite sur un terrain suffissamment vaste pour que ses bâtiments soient isolés de tous les autres rationnellement orientés et puissent être toujours entourés de jardins.

THE EFFECT OF HUMIDITY, TEMPERATURE, AIR MOVEMENT, AND BAROMETRIC PRESSURE ON THE BLOOD PRESSURE, PULSE, AND RESPIRATION OF CHILDREN UNDER THE INFLUENCE OF VARIOUS FORMS OF VENTILATION.

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The various meteoric conditions which enter problems of ventilation have been studied for some time past. These conditions are becoming more and more recognized as important etiological agents in the maintenance of health and the production of disease, and so are receiving more attention both from climatologists and from experts in ventilation. Their importance, therefore, warrants careful investigation on the part of the medical profession.

From an engineer's point of view the standard of ventilation is expressed thus: "The perfectness of the ventilation in a room is ordinarily determined by the amount of carbon dioxid gas."

Other writers point out the discomforts of poor ventilation as being excessive temperature, unpleasant odors, lack of moisture, too much moisture, and too little air movement.

In a recent article W. Gilman Thompson attacks the present methods used by the average engineer for determining the fitness of air for breathing. In lieu of the engineers' method, which he calls the physical method, he proposes a physiological method. The method followed by engineers and that suggested by Dr. Thompson are crudely tabulated as follows:

I. ENGINEERS' OR PHYSICAL METHOD.

- The thermostat and thermometer.
- Cubic feet of air supplied per hour.
- Air analyses.
- Hygrometry.

II. SUGGESTED OR PHYSIOLOGICAL METHOD.

- The use of the nose.
- Blood-pressure tests.
- Metabolism tests. Volume and composition of expired air.
- Symptom tests, as blood tests, headache, indigestion, dyspnœa, etc.

It will be seen at a glance that these two methods are diametrically opposite, for one deals with the man and the other with the environment. Yet the second method has been so much neglected that few reliable data are obtainable concerning it, while the first is supported by volumes of highly impressive theoretical calculations.

It is evident that the engineers have in times past considered the problem as being that of a " room " to ventilate and not " a man " to be ventilated.

From an unsuspected source there has been collected a mass of information which has a direct bearing on ventilation problems. This source is the calorimeter. The classical standard for what seemed good ventilation has been overturned by the data obtained through observations made by means of the Atwater & Benedict calorimeter, in this country, and through a similar apparatus in the hands of Flugge[2] and his pupils, of the Breslau laboratory. Through the researches of these investigators it was shown conclusively that carbon dioxide gas was not as poisonous as believed, since individuals have remained in sealed chambers in which the per cent of this gas was as many as 161 times as great as in normal air, with apparently no injurious effects.

Paul[3] carried out an experiment on himself. He remained 4½ hours in a sealed chamber. Data obtained was as follows:

Temperature.		Humidity (relative).		Carbon dioxid parts per 1,000.	
Beginning.	End.	Beginning.	End.	Beginning.	End.
14	17.2	49	61	0.5	16.1

The carbon-dioxide standard, so long in vogue, took into account only the air in its function as oxygen and carbon-dioxide carrier, leaving out entirely its function as moisture and heat carrier as well as its effect on the vasomotor and other reflex nervous apparatus.

The time has come when we must take a broader view of the function of the atmosphere. We must take into account the air in which we live and not simply the air we breathe.

Most of the discomforts of poor ventilation have to do with air in its effect on the body other than as a means of respiratory exchange. For example, the question of drafts. From the standpoint of respiratory exchange we are benefited by the fresh air brought us by such air currents, but the effect of such air currents on the vasomotor apparatus is quite another matter. Again, air heavily laden with moisture may be well breathed and feel soothing to the mucous membrane; but such air, already saturated with moisture, will take up no more, so that the whole body becomes bathed in perspiration, and the vasomotor and heat centers are worked overtime to accommodate the body to such an environment.

It will be seen, therefore, that air fit to breathe in meets but one requirement—it must be fit to live in. In other words, we are as much affected by the air surrounding us which we do not breathe as by the air we do breathe. Taking this viewpoint, we must inquire in what ways the air which surrounds us but which we may never breathe acts on the body.

I. The most important action is by virtue of the ability of the air to absorb moisture. Evans[4] states:

> The body is constantly giving off moisture to the air. It is estimated that the amount which a healthy person gives off by the skin and lungs together is about 550 grains per hour, which is enough to raise the relative humidity of the vapor in 380 cubic feet, at 60° F., from 75 per cent to complete saturation.

II. The body is also constantly giving off heat. It is estimated that 200 British thermal units are given off in a day for each child and about 500 British thermal units for an adult. The relationship of the heat and moisture in the air is a very close one. H. M. Smith,[5] quoting Warren S. Johnson, says:

> It is a curious fact that it is only through the moisture in the air that it retains heat. Heat naturally radiates from all bodies that are warmer than their surroundings. If the air has little or no moisture in it, the radiated heat goes right through it without warming it. But if it is moist it stops the radiated heat and the moisture is heated. If it were not for the moisture in the air, it would be too cold to live in.

III. Another factor in the air which is constantly affecting the body is the atmospheric pressure. This pressure is constantly changing, and the body is subjected in the vicinity of New York to a change in altitude of approximately 2,500 feet within the space of a few hours.

IV. The vasomotor apparatus is constantly being played upon by the atmospheric environment, one moment opening superficial capillaries, the next moment closing them, in order to maintain circulatory equilibrium. And not only the superficial capillaries, but the large splanchnic area, is at the mercy of environment through reflex action.

V. The body is constantly being stimulated by fresh air or depressed by superheated air. Certain cases, in which there is nervous instability, are greatly stimulated by the fresh open air. It is remarkable how many cases of chorea which have been in the wards for months will quickly recover when sent to the country.

VI. The body, if remaining at rest for a time, naturally becomes a center of vitiated air, which needs to be removed (air envelope of Heymann). Therefore the air, in its function of motility, has an important bearing on the human mechanism, in carrying away heat and moisture, and bringing fresh aid to be again laden.

Each of these functions of the air should be studied in its relation to the human organism, and their interrelationship must also be considered. The subject is complex. The following tabulation sums up the main features, thus:

Functions of the air due to its—
- Moisture.
- Temperature.
- Movement.
- Atmospheric pressure.
- Stimulating or depressing effect.

Functions of the air—their effects on man as shown by changes in—
- Blood pressure.
- Pulse rate.
- Respiration rate.
- Metabolism.
- Nervous phenomena.

All of the above have to do with the effect of air on the surface of the body and do not take into account the air in its function as a means of respiratory exchange.

With many divergent views, it seems advisable to attempt to elicit some data from the individual who is to be ventilated, rather than to study the room which is being ventilated.

No single criterion can be relied upon, but all the data which can be obtained should be considered. No system of ventilation can be counted perfect which (1) causes the pulse to beat unusually fast or slows it unduly; (2) causes rapid or increased respiration or unduly retards it; (3) causes blood pressure to fall below the normal or so changes it as to be inimical to the welfare of the individual.

The ventilation variants in a hospital ward or schoolroom are in the main humidity, temperature, air movement, and barometric pressure. We shall try to point out that each of these by itself may have an effect for good or ill upon the human organism.

The data collected comprise an accurate reading of the temperature of the ward and out-of-door temperative, relative humidity indoors and out of doors, pulse rate, respiration rate, blood-pressure readings, both systolic and diastolic; hourly barometric pressure was recorded and furnished through the courtesy of the United States Weather Bureau.

We will take up these functions of the air, viz, humidity, temperature, movement, pressure, and see if our knowledge of their effect upon the human body can be made of service in determining how best to obtain the maximum degree of efficiency of such function for the human mechanism.

HUMIDITY.

Many writers have contributed to the present knowledge of humidity in its relation to heating and ventilating problems. J. R. Allen,[7] speaking from an engineer's standpoint, says:

> When air is very dry it is necessary for a room to have a much higher temperature, in order that it may feel comfortable, than when the air is moist. It is therefore important that we keep the humidity at a point as high as consistent with satisfactory operation. Cold air contains proportionately less moisture than warm air, and therefore when cold air is heated and brought into a building it should be moistened in order to keep a proper per cent of humidity. The average humidity in the Northern States is about 70 per cent; in the arid regions of Arizona and New Mexico it may be as low as 20 or 30 per cent. In cold weather, if the humidity of the outside air is 70 per cent, and this air is heated and brought into the room without moistening, its humidity may be reduced as low as 30 or 35 per cent, thus making the air as dry as in the most arid regions. This produces a serious effect upon the inhabitants and furniture of the room.

Dr. H. M. Smith,[5] speaking from the standpoint of a physician, states:

> It has been mentioned that the feeling of comfort was greatest in a room of 65° F., with a relative humidity of 60 per cent, produced by artificial means. It was most interesting and instructive, in connection with this matter, to find that, on the perfect days of May and early June, with all the windows opened and admitting freely the outside air, the thermometer stood at from 65° to 68° F., and the hygrometer registered about 60 per cent relative humidity. Generally speaking, dry air is an excitant often causing sleeplessness and irritability, accompanied by a drier skin and quickened pulse. Moist air is more of a depressent, producing quiet sleep and slower circulation of the blood.

Dr. Thompson,[1] already quoted, while agreeing that the humidity arising from letting in the open air is most satisfactory, yet believes that "air which has been superheated and then moistened with steam or water spray in an artificial ventilation system is never quite the same as natural air."

P. W. Goldsbury,[8] in discussing humidity, says:

> The problem of building is to make indoor humidity more nearly like outdoor humidity.

Some work has recently been done in studying the effects of warm humid atmospheres on man by Collis and Pembrey.[18] Their work was done in the English cotton-weaving industry, which industry requires a warm moist atmosphere. They found that the temperature gradually rose from 68° to 101° F. on day of observation; that the relative humidity remained about the same, although the actual humidity was greatly increased. Under these conditions the pulse rate increased from 80 to 118, and respirations from 18 to 29. In another experiment, in which the temperature rose from 70° to 92° F., the relative humidity rose from 51° to 82°. Under these conditions there was an increase in the pulse rate from 80 to 102. They summed up their findings thus:

> The influence of warm moist atmosphere has a tendency to throw a tax upon the powers of vascular accommodation, as indicated by low-blood pressure, notwithstanding the rapid rate of the pulse.

Paul,[8] in studying the causes of discomfort of rooms, considers the most important factor that of humidity. One of his experiments is related: Patient placed in sealed chamber. Temperature at beginning 22.5° C. Relative humidity 50 per cent. Humidity was quickly raised to 76 per cent and temperature to 30° C. Under these conditions, the chamber became uncomfortable in five minutes; whereas a much longer time elapsed before chamber became uncomfortable, when humidity was not raised so rapidly or to so great an extent.

Ercklentz,[9] studying the chemical contaminations of the air in a closed chamber, believes such contamination to be without effect, and concludes with Paul, that the discomfort arises from the moisture and temperature of the surrounding air.

In order to obtain data concerning the relation of indoor humidity to outdoor humidity, and to the various changes in pressure, pulse, and respiration, a series of observations were made with and without the use of the humidistat connected with the hospital ventilation system. A study of the relation of indoor and outdoor humidity, on succeeding days, with the humidistat, admitting different amounts of moisture, is first presented:

January 24.—Engineer's data concerning ventilation system: All inside coils on. Temperature in duct, 60° open. Fan, 134 revolutions, ninth notch. Humidistat full on closing and opening every 2 minutes. Temperature of ward, 70° F.

Humidity observations: Average of 6 observations, taken between 9 a. m. and 6 p. m. in ward, relative humidity 51.2 per cent. Average of 6 observations taken at same hours outside, relative humidity 59.5 per cent.

January 25.—Engineer's data: All inside coils on. Temperature of duct, 59–61° open. Fan, ninth notch, 134 revolutions. Humidistat at medium on and off every 2 minutes.

Humidity observations: Average of 5 observations, taken between 9 a. m. and 3 p. m. in ward, relative humidity 33.4 per cent; outside relative humidity, 56 per cent, being the average of 5 readings taken at same hours as noted for inside.

January 26.—Engineer's data: All inside coils on. Temperature of duct, 59–65°. Closed at 65°. Fan, ninth notch, 134 revoluions. Humidistat off.

Humidity observations: Six observations, between 9 a. m. on January 26 and 9 a. m. on January 27 in ward, relative humidity, 37 per cent. Average of 6 observations taken at same hours outside, relative humidity, 72 per cent.

January 27.—Engineer's data: Inside coils all on. Air in duct, 42°. Fan, ninth notch, 134 revolutions. Humidity full on.

Humidity observations: Average of 5 observations, taken between 10 a. m. and p. m. in ward, relative humidity, 36.4 per cent. Average of 5 observations, taken at same hours outside, relative humidity, 78.4 per cent.

The average for these four days in which the humidity apparatus was tested gives inside humidity 40 per cent, and outside, taken over the same period of time, average 66 per cent; average temperature inside, 68.5°; outside, 21°. On the four succeeding days the humidity in the ward was controlled entirely by opening and closing windows, the humidity apparatus being shut off. The average for the four following days was, indoor humidity, 41 per cent; outside humidity, 76 per cent; average temperature inside, 65.5°; outside, 28°. On the four days in which the humidity apparatus was in use the ward was kept closed, except in so far as it was necessary to open and close doors leading to balconies.

From the above observations it appears that by judicious use of the open window the indoor humidity may be kept at about the same per cent as with the use of the humidistat. No doubt it requires more fuel to keep the temperature of the ward at 65° by the open-window method.

Another series of observations, taken in different wards, when the temperature was higher shows, in general, the same results. For example, the average humidity, by open-window method, during a portion of April and May, 1912, in three different wards was as follows: 44.2, 45.3, and 47.2 per cent, while the average outside humidity was 59 per cent. During the same period the indoor temperature was 65.4°, 67.5°, 63.9°, with an outdoor temperature of 57°. It will be seen from the above figures that by the open-window method there is an average of 15 per cent difference in the relative humidity indoors and out of doors and a difference in temperature of 7°.

During these observations a series of blood-pressure readings was taken. Only such patients as were confined to their beds and who had no increase in temperature were considered. The pressures were taken about the same time each day, using the same arm, and results were recorded day by day by the writer without any knowledge of the previous day's findings. The blood-pressure readings were taken by means of the automatic device for indicating systolic and diastolic blood pressure, as devised by the author.

A group of about 10 patients were examined and blood pressures recorded in each of the 3 wards each day. The pressures were then added together and an average for the ward for that day determined. The same patients were examined the following day and an average struck. It is this average pressure which I have used in compiling my data, since it is obvious that the average of a number of pressures would furnish a better basis for study than individual blood pressures.

The same method was carried out as regards pulse and respiration. The relative humidity was determined by the use of the Sling psychrometer, and the tables of the United States Weather Bureau used in computation.

BLOOD PRESSURE AND HUMIDITY.

Systolic blood pressure and humidity.—Of all cases showing a falling systolic pressure during a changing humidity 67 per cent occurred during a rising humidity and 33 per cent during a falling humidity.

Of all cases showing a rising systolic pressure during a changing humidity 50 per cent occurred during a rising humidity and 50 per cent occurred during a falling humidity.

Of all observations taken during a rise or fall in humidity 60 per cent went in a reverse direction to humidity and 40 per cent went with the humidity.

Diastolic blood pressure and humidity.—Of all cases showing a fall in diastolic pressure during a changing humidity 67 per cent occurred during a rising humidity and 33 per cent during a falling humidity.

Of all cases showing a rise in diastolic pressure 60 per cent occurred during a period of falling humidity and 40 per cent during a period of rising humidity.

Of all observations taken showing a changing diastolic pressure during a changing humidity 65 per cent were in reverse order to humidity.

Of all observations taken 58 per cent were in a reverse order to humidity, 30 per cent were in the same order, and in 12 per cent either the diastolic or the humidity were stationary.

Pulse pressure and humidity.—Of all cases showing a fall in pulse pressure during a changing humidity 67 per cent occurred during a period of rising humidity and 35 per cent during a period of falling humidity.

Of all cases showing a rise in pulse pressure 46 per cent occurred during a period of falling humidity and 54 per cent during a period of rising humidity.

Of all observations showing a changing pulse pressure during a changing humidity 58 per cent were in reverse order to humidity.

Of all observations taken 55 per cent were in reverse order to humidity, 40 per cent were in the same order, and in 5 per cent either pulse pressure or humidity were stationary.

In a large number of the observations on systolic and diastolic pressure the variations in humidity were very slight, in fact not sufficient to produce any marked change in pressure. During those periods in which the humidity varied considerably the results on blood pressure were much more marked, as is shown by the following figures: During the course of the observations there were 17 times when the humidity varied over 20 per cent within 24 hours. During these periods the blood pressure went in reverse order to humidity in 77 per cent of observations.

The combined effect of humidity and temperature on the blood pressure will be considered under temperature.

Effect of humidity on pulse rate.—A falling humidity was accompanied by an increase in pulse rate in 23 per cent and a decrease in 77 per cent of cases. A rising humidity was accompanied by an increase in pulse rate in 22 per cent and a decrease in 78 per cent of cases.

Combined effect of humidity and temperature on pulse rate.—A rising humidity and rising temperature was accompanied by an increase in pulse rate in 205 per cent and a decrease in 80 per cent of cases. A falling humidity with rising temperature was accompanied by an increase in pulse rate in 22 per cent and a decrease in pulse rate in 78 per cent of cases. A rising humidity with falling temperature was accompanied by an increase in pulse rate in 25 per cent and a decrease in 75 per cent of cases. A falling humidity and a falling temperature was accompanied by an increase in pulse rate in 25 per cent and a decrease in 75 per cent of cases.

Effect of humidity on respiration.—A falling humidity was accompanied by an increase in respiration rate in 46 per cent and a decrease in 54 per cent of cases. A rising humidity was accompanied by an increase in respiration rate in 33 per cent and a decrease in 67 per cent of cases.

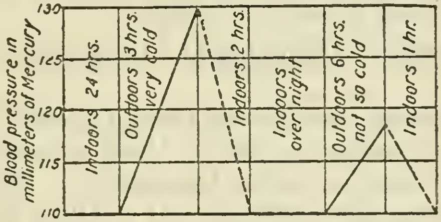
Combined effect of humidity and temperature on respiration.—A rising humidity and rising temperature was accompanied by an increase in respiration rate in 40 per cent and a decrease in 60 per cent of cases. A falling humidity and rising temperature was accompanied by an increase in respiration rate in 55 per cent and a decrease in 45 per cent of cases. A rising humidity and falling temperature was accompanied by an increase in respiration rate in 25 per cent and a decrease in 75 per cent of cases. A falling humidity with falling temperature was accompanied by an increase in respiration rate in 25 per cent and a decrease in 75 per cent of cases. For the combined effects of humidity and barometer on pulse and respiration, see under Barometer.

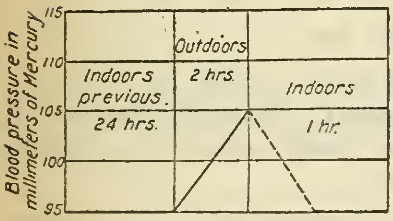
TEMPERATURE.

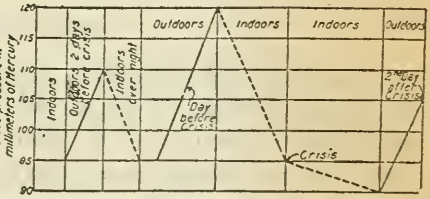
The temperature of the air has a very distinct relation to the blood pressure. The writer[10] observed that the effect of removing children with pneumonia from the warm ward to the cold, fresh air was to increase their blood pressures. This is true not only for pneumonia but for tuberculosis and a number of other diseases as well. Charts demonstrating the effect of cold fresh air in several conditions are shown here.

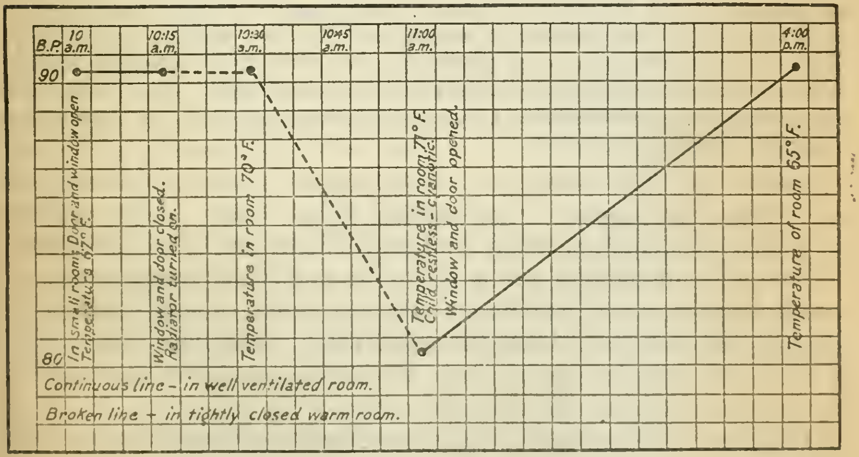
Not only has it been shown that cold air raises blood pressure, but it has also been shown that in a child with pneumonia, taken from the ward at a temperature of 65° and placed in an unventilated room with a temperature of 71°, the blood pressure will fall considerably.

The effect on the blood pressure of the cold fresh air is also obtained by placing the child in a cold, well-ventilated room. The chart also shows that the blood pressure varies with the temperature. During a period of low temperature the blood pressure was considerably increased.









Other observers have noted the effect of temperature on blood pressure. L. S. Peters,[11] studying tuberculosis cases at Silver City, N. Mex., and referring to the effect of temperature on blood pressure, says: "Apparently the higher the temperature the lower the blood pressure."

Open air, regardless of temperature, has a decided effect upon the normal as well as the diseased individual. P. P. Eminet[12] examined a large number of healthy children from 7 to 15 years of age in an attempt to find out the influence of outdoor life on the pulse and blood pressure. His findings are summed up as follows:

> Children living out of doors show an increase in blood pressure, in some cases as much as 30 mm. of mercury. In only 7 out of 140 cases studied was there a decrease in pressure. The rate of the pulse was increased by outdoor life. Children living under good surroundings have, in general, a higher blood pressure than children living in poor surroundings.

The combined effect of humidity and temperature is shown in the following study:

Of all blood-pressure observations taken, the conditions which were most favorable in causing a fall in blood pressure were a rising humidity with a rising or falling temperature. The most favorable condition for raising blood pressure was a falling temperature, with an accompanying fall in humidity.

EXCHANGE OF AIR.

All systems of ventilation depend upon exchange of air and not of the purification of air already present. Hence, air movement is an important factor. J. R. Allen,[7] in "Notes on heating and ventilation," has this to say on air movement:

> In order that air in a room occupied by human beings may be reasonably pure, it should be diluted with fresh air. The amount of the dilution is usually determined by the per cent of carbon dioxide present, which is presumed to be proportional to the products of respiration. Air that contains more than 10 parts of carbon dioxide to each 10,000 parts of air is of an unhealthy quality. Air in living rooms should be changed two times each hour. In extreme cases the change of air is sometimes as high as 10 times per hour. If changed too frequently, drafts are caused.

Snow,[13] in "The ventilation of buildings," says that a velocity of air 1½ feet per second is not sensible to the senses, and a velocity of 3 feet per second, or about 2 miles per hour, causes no discomfort.

The effect of moving air on the pulse and blood pressure has recently been shown by Starling.[14] He states that "a cold wind has a definite influence in raising the pulse rate." Not only does a cold wind, but a mild breeze, and even the movement of air when sitting in an open street car affect the pulse rate.

Heymann[6] showed that the air immediately surrounding the body contained a much greater per cent of carbon dioxide than the room air in which the person was sitting. The exact data of one of his experiments is presented: Inspired air contained 1.247 parts carbon dioxide per 1,000; room air contained 0.430 part carbon dioxide per 1,000.

BLOOD PRESSURE AND BAROMETER.

It has been known for a long time that barometric pressure affected the circulatory system, and the relation of this meteoric condition to pulse rate and blood pressure has been most carefully studied. R. P. Pomeroy[15] has gone over the literature and added his own observations and concludes that "the results of nearly all experimental data show that diminished barometric pressure lowers the blood pressure." C. F. Gardiner and Hoagland[16] showed conclusively that persons changing from an elevation of 6,000 feet to one of 14,130 feet experienced a fall in blood pressure and a rise in pulse rate.

Schneider and Hedblom,[17] working with an Erlanger sphygmomanometer, noted that "considerable elevation in altitude tended to lower systolic and diastolic blood pressure and increase the rate of the heart. The fall in systolic pressure is slightly greater and more certain to occur than the fall in diastolic pressure."

In studying the effect of the changes of barometer on the blood pressure, it was found that the systolic pressure rose and fell with the barometer in 57 per cent of the cases, and in 54 per cent the systolic blood pressure went in reverse order to the barometer.

In the observations on diastolic pressure it was found that 50 per cent went with and 50 per cent went opposite to the rise or fall of the barometer.

The pulse pressure followed the barometer in its rises and falls in 54 per cent of the cases and went opposite to the barometer in 46 per cent.

The above figures are based on very small rises and falls in the barometer. In every case in which there was a marked fall in barometer there was also a marked fall in both systolic and diastolic pressures. It was equally true that when there was a sharp rise in barometric pressure there was also a rise in systolic and diastolic blood pressures.

COMBINED EFFECT OF BAROMETER AND HUMIDITY ON BLOOD PRESSURE.

Systolic.—Observations taken during a rising barometer and a rising humidity showed a rise in systolic pressure in 30 per cent and a fall in 70 per cent. Observations taken during a falling barometer and a rising humidity showed a rise in systolic in 14 per cent and a fall in systolic in 86 per cent of cases. A rising barometer and falling humidity produced a rise in systolic in 50 per cent and a fall in 50 per cent of cases.

A falling barometer and a falling humidity produced a rise in systolic in 33 per cent and a fall in 67 per cent of cases.

Diastolic.—Observations taken during a rising barometer and a rising humidity showed a rise in diastolic pressure in 25 per cent and a fall in 75 per cent of cases studied.

Observations taken during a falling barometer and a rising humidity showed a rise in diastolic pressure in 14 per cent and a fall in 86 per cent of cases.

A rising barometer and a falling humidity produced a rise in diastolic pressure in 50 per cent and a fall in 50 per cent of cases.

A falling barometer and a falling humidity produced a rise in diastolic pressure in 33 per cent and a fall in 67 per cent of cases.

Pulse pressure.—Observations taken during a rising barometer and a rising humidity showed a rise of pulse pressure in 30 per cent and a fall in 70 per cent of cases.

A falling barometer and rising humidity showed a rise in pulse pressure in 28 per cent and a fall in 72 per cent of cases.

A rising barometer and falling humidity produced a rise in pulse pressure in 40 per cent and a fall in 60 per cent of cases.

A falling barometer and a falling humidity produced a rise in pulse pressure in 33 per cent and a fall in 67 per cent of cases.

Wherever there was a marked fall in barometer, with a marked rise in humidity, there was a fall in both systolic and diastolic pressures.

Combined effect of barometer, temperature, and humidity.

Barometer.	Temperature.	Humidity.	Effect on systolic pressure.		Effect on diastolic pressure.		Effect on pulse pressure.	
			Rise.	Fall.	Rise.	Fall.	Rise.	Fall.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Rising	Rising	Rising	33	67	33	67	33	67
Do	do	Falling	40	60	40	60	80	20
Do	Falling	Rising	66	34	25	75	66	34
Do	do	Falling	43	57	43	57	30	70
Falling	Rising	Rising	......	100	......	100	......	......
Do	do	Falling	50	50	100	......	......	100
Do	Falling	Rising	50	50	50	50	50	50
Rising	do	Falling	33	67	......	100	......	......
Falling	do	do	......	......	......	......	67	33

EFFECT OF BAROMETER ON PULSE.

A falling barometer was accompanied by a rise in pulse rate in 27 per cent of cases and a fall in pulse rate in 73 per cent of cases. A rising barometer was accompanied by a rise in pulse rate in 25 per cent of the cases and a falling pulse rate in 75 per cent of the cases.

The combined effect of humidity and barometer on the pulse rate. A rising barometer and a rising humidity was accompanied by increase of pulse rate in 25 per cent and a decrease in pulse rate in 75 per cent. A falling barometer with rising humidity was accompanied by a rising pulse rate in 20 per cent and a decrease in pulse rate in 80 per cent of cases. A rising barometer and falling humidity was accompanied by an increase in pulse rate of 17 per cent and a decrease in 83 per cent of cases. A falling barometer and a falling humidity was accompanied by an increasing pulse rate in 30 per cent and a decrease in 70 per cent of cases.

EFFECT OF BAROMETER ON RATE OF RESPIRATION.

A falling barometer was accompanied by an increase in rate of respiration in 54 per cent and a decrease in rate in 46 per cent of cases. A rising barometer was accompanied by an increase in respiration rate in 11 per cent and a decrease in 89 per cent of cases.

COMBINED EFFECT OF HUMIDITY AND BAROMETER ON RATE OF RESPIRATION.

A rising barometer and a rising humidity was accompanied by an increase in respiration rate in 25 per cent and a decrease in 75 per cent of the cases. A falling barometer with rising humidity was accompanied by an increased respiration rate in 40 per cent and a decrease in 60 per cent of cases. A rising barometer and falling humidity was accompanied by an increased respiration rate in 17 per cent and a decrease in 83 per cent of cases. A falling barometer and falling humidity was accompanied by an increased respiration rate in 70 per cent and a decrease in 30 per cent of cases.

From the foregoing it would seem that the most favorable conditions for maintaining the blood pressure at normal are those present in open air. To obtain the same result indoors, such methods of ventilation should be employed as to approximate the conditions out of doors. In unventilated rooms and in rooms having poor ventilation the tendency is to depress the circulatory system and reduce blood pressure, particularly if temperature and humidity are increased.

After several years' study of this problem the writer is thoroughly convinced of the desirability of having open-air balconies connected with every hospital ward and patients properly protected, exposed to the beneficial effects of the open, moving air.

SUMMARY.

1. The human body is affected by the air which surrounds it as well as by the air which is breathed.

2. Air conditions which most affect the circulatory system of the body are amount of moisture, degree of temperature, force of air movement, and atmospheric pressure.

3. A marked increase in relative humidity tends to depress the circulatory system and to decrease the blood pressure.

4. A marked decrease in temperature tends to stimulate the circulatory system and increase the blood pressure, particularly in those diseases in which there is instability of the vasomotor system, as, for example, pneumonia, and tuberculosis.

5. A marked increase in barometric pressure tends to increase blood pressure.

6. When the three factors—temperature, humidity, and barometric pressure—are considered together their influence on the blood pressure is in the order stated.

7. The effect of temperature, humidity, and barometric pressure on the rate of pulse and respiration is slight when variations are within narrow limits, such as may occur in the average hospital ward.

Under conditions where temperature and humidity are greatly increased there is a marked increase in rate of pulse and respiration. A marked fall in barometric pressure tends also to increase the pulse and respiration rate.

8. The method of ventilation best adapted to the maintenance of blood pressure is that which most nearly approximates out-of-doors conditions.

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THE ROUTINE DISINFECTION OF SCHOOLS.

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Among the numerous problems confronting educationists none, perhaps, is more insistent or more difficult of solution than that of the prevention of infectious disease. Viewed from any standpoint—hygienic, educational, or financial—school epidemics are deplorable; yet, as is evidenced by reports from all parts of the country of the closure of schools owing to infectious outbreaks among the scholars, all the remedies and all the palliatives hitherto brought to bear against them have done little more than touch the fringe of the evil.

The most common school diseases are measles, diphtheria, scarlet fever, and whooping cough, while the available data tend to show that tuberculosis may exist among school children to a much greater extent than is commonly believed. The facts that the first four of these diseases are generally infectious before they can be diagnosed, and that both scarlet fever and diphtheria remain so after the patient has apparently recovered, greatly increase the difficulty of preventing outbreaks among school children and of confining within moderate limits such outbreaks when they have occurred. Pathologists are agreed that each of these diseases is caused by a specific germ. The diphtheria bacillus and the tubercle bacillus have been isolated, studied, and definitely referred to their respective diseases. Although the bacteriology of scarlet fever, measles, and whooping cough has not yet disclosed the complete life history of their specific organisms, the analogies between the various stages of these maladies and the corresponding stages of those in which the specific organism has been identified are so complete that we are justified in assuming that the causal agent in each case is a micro-organism. If this be so, it will be admitted on all hands that the one intelligent method of preventing these diseases is the timely destruction of the causal agent. I would go even further and say that in all cases in which the specific germ has not yet been isolated, but in which various pus cocci appear as the causes of purulent affections of throat, nose, and ear in sequelæ of measles, scarlet fever, etc., the destruction of these germs should be carefully secured.

In the course of his evidence before the consultative committee, upon the school attendance of children below the age of 5, Dr. Newsholme, medical officer to the English Local Government Board, said:

> Infectious diseases are caught in the streets only with great difficulty, and this may be described as retail infection, as against the wholesale infection of the schools.[1]

Sir Shirley Murphy, medical officer to the London County Council, in a paper communicated to the Second International Congress on

School Hygiene, points out that school attendance concerns the general health, for it means an increase of infectious disease.[2] Dr. Henry Kenwood, Chadwick professor of hygiene in the University of London, in a paper on the "Disinfection of school premises,"[3] says:

> The statistical evidence in support of school attendance being responsible for the spread of infection is overwhelming. The incidence of most of the infectious diseases is upon those of school age; school children therefore represent the most inflammable material in the community upon which the spark of infection may alight. If, then, we collect and concentrate that material day by day within the narrow compass of school premises, the risks of the spread of infection must be at a maximum on such premises. It must also be admitted that the condition of overcrowding, which demonstrably favors the spread of disease in the general community, comes into operation in an exaggerated form in our classrooms. The above circumstances must combine to make such school classrooms exceptionally favorable centers for the transmission of disease.

In this connection the following extracts from a paper entitled the "Control of certain infectious diseases amongst school children," by Dr. Leslie Kingsford, school medical officer of Liverpool, published in the Medical Officer of May 25, 1912, will be read with interest:

> Inquiries made during the years 1900 and 1910 elicited the somewhat surprising information that in only 1.5 per cent of the school cases was there a history of a recent previous case in the house. Consequently, where there is a susceptible school child in the family, it is found in practically every instance that this child is the first to contract the disease and is the one chiefly responsible for handing it on to the younger members of the family who do not attend school. * * * The investigation into the cases of whooping cough occurring during 1910 showed that previous cases at the homes were discovered in only 27 instances, or 0.8 per cent of all the cases, so that in this disease, also, home infection is of little account with respect to the infection of school children.

The case for routine disinfection is clearly and succinctly stated by Prof. Kenwood in the paper referred to above. He says:

> No one who is conversant with all the facts will dispute the contention that the periodical disinfection of school premises is an important branch of school hygiene which is often culpably neglected. A systematic disinfection of school premises is, with rare exceptions, performed only as a consequence of the epidemic prevalence of infectious disease among the scholars, and even then the methods adopted are not always those which the more recent scientific work has demonstrated to be the most effective. Yet the facts which indicate the necessity for this precaution, as a routine practice, are of a very striking and convincing nature. * * * Missed early or mild cases spread much infection in school classrooms; and frequent disinfection is an easily practicable means of reducing their potency for evil.
>
> In addition to these mild cases of infection there may be "carrier cases," namely, children who are passive carriers of infection while not themselves affected in any way by the germs they harbor in their throats or in their noses, etc. In some school outbreaks of diphtheria the "carrier cases" in a class from which several sufferers have previously been removed have been found to be far more numerous than the actual sufferers; but while in good health and

> fully capable of benefiting from schooling, they may disseminate virulent germs upon the other scholars and the desks, floors, books, etc., of the classroom when they cough, sneeze, recite, or sing. Flügge and others have demonstrated that the germs may thus be sprayed into the atmosphere for several feet from the individual. The infection of scarlet fever, diphtheria, measles and whooping cough from such insidious sources, remaining unrecognized in periods when the class attendance is good, may light up a considerable measure of school infection. But the plea for routine disinfection of school premises does not end with the case in reference to common infectious diseases; there are cogent grounds for adopting the practice as a serviceable precaution against the spread of consumption and certain disease-producing organisms on skin, hair, and clothes, which are known sometimes to constitute a part of classroom dirt and dust. * * * It is indeed surprising that so little should be done in the face of the recognized frequency of classroom infection and the consequent epidemic prevalence of disease, and in the face of the evidence that is gradually accumulating of the valuable results accruing from the frequent disinfection of school premises.

The Scotch Education Department, in a memoradum entitled, "The cleansing and disinfecting of schools," has expressed its views as follows:

> The "close smell" so familiar in the schoolroom is due partly to the subtle organic impurities of the air breathed out by the children, partly to the decomposition of organic dirt on the children's bodies or in the room. Such decomposition is normally caused by microbes. Hence, to cleanse a schoolroom properly, it is necessary to destroy the germ life, as well as to remove the visible dirt. This is why periodic disinfection is advisable, *even when no known infectious disease has been present.*

To multiply opinions in support of systematic disinfection of schoolroom floors, would be an easy matter, but it is unnecessary.

We are probably all agreed as to the presence in most schools of a certain proportion of children in the infectious stages of one or other of the diseases already mentioned. Such children can not fail to diffuse infectious material: and that that material, if allowed to accumulate on the floors, to become mingled with the dust, and to be inhaled by the children, must give rise to fresh cases of the disease, is a proposition which should be evident to all unbiased minds.

Let it be granted that the major part of school infection is due to direct contact; there still remains that proportion which is due to the inhalation of bacilliferous dust. Under existing conditions it is impossible to avoid infection by the former means; it is, however, quite possible to avoid infection by the latter. This is why the systematic disinfection of schoolroom floors should be regarded as an important item in every system of school hygiene.

Acceptance of this argument leads naturally to consideration of the method of disinfection to be employed. This, I am strongly of opinion, should take the form of the liquid spray, which is preferable to gaseous disinfection for two reasons: (1) Because the liquid disinfectant insures actual contact with the infected matter, and (2) because the liquid disinfectant tends to prevent dust—the common vehicle of infection—from rising into the air. In the words of Dr. Leslie Mackenzie, medical officer to the Local Government Board for Scotland:

> Formerly, when infectious disease broke out in a school, a pound or two of sulphur was burned in a basin standing in water, the windows, chimney, and other crevices having been first stuffed up. The place remained closed for a day or two, and was then supposed to be disinfected. This primitive method is still followed in many places, and probably it still satisfies many people. I prefer the simpler, quicker, and more effective method of spraying the walls, floors, desks, and furnishings with a spray pump. This is the quickest method of laying the dust, and I know of no better preliminary to effective cleansing.

It is unnecessary to point out that unless the disinfectant employed be efficient, routine disinfection can be nothing more than a waste of time and money. Aerial disinfection, or fumigation, is still used in some places in this country, in spite of the fact that it has been repeatedly condemned by international congresses and scientific workers generally. Modern research has demonstrated that a better control can be obtained by more direct measures against the organisms of disease and the envelope of dirt by which they are habitually surrounded and conveyed, and this is why the liquid spray is now most generally employed.

To avoid the objectionable odor inseparable from the use of certain disinfectants of low efficiency, necessitating proportionately low dilutions, I would advocate the use of one of the modern high testing disinfectants in a dilution equivalent to at least 1 part pure carbolic acid in 25 parts of water—say one with a Rideal-Walker coefficient of 20, the dilution of which, equivalent to 1:25 carbolic acid, would be 1:500. Taking the cost of such a preparation at $1.50 per gallon, a superficial area of 10,000 square feet could be disinfected daily, for a week, at a cost of approximately 40 cents.

When school is over for the day, the floor of each classroom should be moistened with the above solution by means of an ordinary sprinkling can fitted with a fine rose, and swept in the usual manner while still damp. The desks and seats should be dusted with a cloth sprinkled with the same solution. Dry dusting and sweeping should on no account be permitted; they merely displace the bacilliferous dust, which, after floating in the air for a time, settles again on the floors and desks. Once a week the walls, to a height of 6 or 7 feet from the ground, should be moistened with the same preparation by means of a spraying machine; seats, desks, hat and clothes pegs should be treated in the same manner, particular attention being paid to the last named, while care should also be taken that the tops of the cupboards and other inaccessible places where dust may collect are thoroughly wetted with the solution. Every quarter the spraying operations should be extended to include all parts of the walls and ceiling.

The routine disinfection of schools, as a systematic preventive measure, was first seriously considered in Great Britain in 1907. In his presidential address at that year's congress of the British Medical Association, Dr. Henry Davey said, in reference to tuberculosis, " the only way actually to prevent the disease is by a perfect system of school hygiene, physical and mental, and by a careful system of disinfection and sanitation." But what probably did more than anything else to secure adherents to the process was the issue, by the Scotch Education Department, of the memorandum to which allusion has already been made. During the four and a half years which have elapsed since that time routine disinfection has been adopted by hundreds of education authorities.

If further argument in favor of routine school disinfection be required, it may be found in the fact that the evil effects of breathing bacilliferous dust can not be gauged solely by actual absence through illness. Many of the minor ailments so contracted may be too mild to warrant absence from school or to call for immediate treatment, while being serious enough to lower the vitality of the child to such an extent as to affect its receptive capacity during school hours. Children are legally enforced to attend school, and it surely follows that they should be allowed to do so without encountering any danger which is avoidable by ordinary measures of human precaution.

The position may be summarized as follows: The presence of a certain proportion of infectious children is admittedly unavoidable. These infectious children must diffuse a certain amount of infective material, the removal of which by means of frequent and thorough washing of classrooms and cloakrooms is, on the ground of expense, impossible, or is at least so regarded by the education authorities; the daily sprinkling of the floors with a disinfectant solution offers an inexpensive and easy method of minimizing the harmful effects of that material during the intervals between cleansing. Viewed in this light—*not as a panacea or as a substitute for cleansing*—it is difficult to understand why the benefits to be derived from this process should not appeal more generally to those responsible for the management of our public schools.

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[1] Report of committee, page 78.

[2] Lancet, Aug. 10, 1907, p. 406.

[3] The School World, September, 1908.

DISCUSSION.

William Estabrook Chancellor: One schoolhouse with 900 children had 325 pupils with throat, nose, and similar diseases—diphtheria, sore throat, colds, etc.—all save two in the second and third floors. By means of certain disinfection methods, including clean shoes, hands, hair, etc., the infection was kept from spreading upon the first floor, and nothing of that kind has ever occurred since. We use formaldehyde in all the ways suggested, spraying at least once and often twice a day. We have also oiled the floors once or twice a year, and air the rooms thoroughly after each disinfection. Our costs have been about $10 a room per year. We must keep infection out and kill it when we find or suspect it.

Dr. Thomas F. Harrington, Boston, Mass.: Physicians and public-health officials have grown quite skeptical about the value and the efficiency of room disinfection by chemical agents. There are no fixed authentic standards. The daily disinfection of classrooms is not practicable. Few municipalities could carry it out effectively. There is, however, one method that commends itself; namely, the repeated and thorough flushing of each classroom with fresh air by means of open windows and doors. In Boston the rules of the school committee provide that this be done each session between the opening session and recess; during the recess and physical education period, at the close of each session; and at the close of evening school session. There has been less absence among teachers and pupils, and epidemics of communicable diseases have disappeared since the adoption of this plan. We oil the school floors. Recent investigations do not support the belief that the schools are foci of infection. I have never known an outbreak of a communicable disease among school children that was not associated with an outbreak of the same disease in the neighborhood, and easily traceable to some home or church sociable or gathering of children occurring prior to the school outbreak. Furthermore, the daily returns for 25 years at the office of the Boston Board of Health show that the incidence curve of diphtheria and scarlet fever falls three weeks before the closing of school time in June, and rises three weeks before the opening of the fall term—September. If known cases of contagion could be controlled in the homes, and "carriers" excluded from school, the danger of contagion would be reduced to a minimum.

Dr. J. N. Hurty: The chief value of aerial disinfection lies in the fact that it is followed by thorough ventilation to get rid of the smell. Surface disinfection is the cleansing of surfaces by washing and wiping afterward with an approved disinfectant. Necessity of disinfection will be lessened by attention to oral hygiene. The infections of diphtheria, scarlet fever, measles, poliomyelitis, and quite all of the school epidemic diseases, proceeds from the oral and nasal cavities. Keep these cavities as clean as possible by all rational means, and school epidemics will be enormously lessened.

Dr. Boyd W. Knight, New York: I have been much impressed for some years by Dr. Walker's work along this line in England

and in India. I do not consider that sunlight only can be relied on to disinfect school rooms, and strongly urge, therefore, that a standard be adopted which will enable the proper officials to select the most meritorious disinfectant, thus eliminating the danger attendant upon the use of much advertised, but worthless, products; namely, a false sense of safety after such have been used.

Mr. H. O. Way, Cleveland, Ohio: In Cleveland we have been using formaldehyde for school fumigation. We have demonstrated, from our own experiments, that moisture is the condition most essential for success. If the object to be disinfected is moist the amount of formaldehyde usually recommended will be effective in one hour; but if it is dry an exposure of one week will be inefficient.

I am in accord with the views held by Dr. Chapin, of Providence, that disinfection is useless unless preceded by a removal of bacillus carriers. It seems useless to go to the expense of disinfection, only to have the room reinfected by a bacillus carrier.

Dr. Ainslie Walker: I may say that oil treatment of schoolroom floors has been tried in England repeatedly, but always without success. When applied every other week, it was found to harbor dirt and accumulate infective material, and when applied at longer intervals the effect produced was inappreciable, owing to the oil being absorbed by the fiber of the wood. I know of no oil available for this purpose having any bactericidal efficiency. A 2 per cent solution of formalin, in my opinion, is of little value. The carbolic coefficient of formalin is 0.3. The dilution necessary to produce a bactericidal solution equal to 1:25 carbolic (the standard strength employed in hospital work) is therefore 1 part formalin to 7 parts of water—a dilution which is found to be impracticable, owing to the suffocating nature of the gas. As regards fumigation with formaldehyde gas, expert opinion differs widely as to the value of this process. The marked discrepancies in results obtained, even in laboratory experiments, where the various factors are more or less under control, have been pointed out on many occasions. In practice, where these factors can not be controlled, the discrepancies are even more pronounced. For this reason, disinfection by means of formaldehyde vapor can not be recommended for general use. Dry formaldehyde gas has no value at all, hence the introduction of steam to provide the necessary moisture for producing the solution of formaldehyde, without which there is no action. The difficulty in producing a solution of the required strength by this means will be apparent. No difficulty is experienced, on the other hand, where the disinfectant spray is employed. Mention was also made of the use of sulphur in fumigation. Of this product, I would only say that it has been repeatedly condemned by international congresses during the past 20 years. The British Medical Journal of November 3, 1894, refers to its use in the following terms: "On the ground even of economy there is no comparison between this obsolete process and the disinfectant spray." As regards Dr. Hurty's plea for fresh air and oral hygiene, in suggesting routine disinfection of classroom floors, I am assuming, of course, that both have had proper attention. No amount of fresh air alone, however, can destroy the infective material to be found on the average schoolroom floor. I was much interested in Dr. Chancellor's description of the method employed by him in dealing with the septic sore throat outbreak. I fear, however, that the cost (quite apart from the question of efficiency) would make it prohibitive. In reply to Dr. Woods, I should like to say that, although I have no figures before me at the moment, an experiment extending over a year was carried out by the Buckinghamshire Education Committee, with the view of obtaining the data for which Dr. Woods asks. This consisted in comparing the attendances at two groups, each consisting of 24 schools, of which one group had been disinfected daily, and the other not at all. The result showed an appreciable decrease in the percentage of children absent, through sickness, from the disinfected schools, the increase in the Government grant earned (through the better attendance) being sufficient to pay for the cost of disinfection and to leave a balance in hand. For the actual figures, I must refer Dr. Woods to the Annual Report of the Buckinghamshire Education Committee for 1909.

TUESDAY AFTERNOON, SEPTEMBER 24, 1912.

THE REDUCTION OF INFANT MORTALITY IN NEW YORK CITY.

S. JOSEPHINE BAKER, M. D., Director of Child Hygiene, Department of Health, New York City.

In the reduction of the death rate in any age group, or even from any specific cause, there is often danger in placing too great emphasis upon methods in their relation to results. This dictum may be considered as particularly true with reference to infant mortality.

General improved sanitation and hygiene have shown their effects in regard to the lowering of the death rate of infants under 1 year of age, in much the same ratio that has obtained in the lowering of the general death rate as it pertains to the class of cases that might reasonably be affected by such an influence.

A marked increase or decrease in the infant death rate during a short period of time may also be misleading. Incidents are not wanting where congratulations on a lowered death rate have been followed by a feeling of despondency when, with apparently the same conditions and methods, the death rate has again assumed an upward tendency.

A marked instance of such a transitory reduction was noted in New York City in 1903. In that year there was a numerical decrease of 1,112 deaths under 1 year of age. The following year there was a numerical increase of 1,712 deaths for the same age period. This increase persisted with a less degree of intensity until 1908, when the division of child hygiene was organized, and the department's efforts were broadly developed along preventive lines.

In general, in New York City, the decline of the infant mortality rate has been regular during the past three decades. During the 30-year period from 1880 to 1910 the rate declined from 288.9 to 133.9 per thousand infants living under 1 year of age.

Considering the causes of death, as grouped in four general classes, a reduction of 70 per cent was shown in the contagious diseases, 37 per cent in the diarrheal diseases, 38 per cent in the respiratory diseases, and 4 per cent in the group known as congenital diseases, including marasmus. During the period of time between 1876 and 1908 the Department of Health of New York City dealt directly with the situation in the summer months only by detailing physicians to treat sick babies, by lectures to mothers on baby care, and by the distribution of educational printed matter on the same topic.

These efforts were supplemented by various private charitable organizations, but it would be difficult to determine if this work had any extensive or direct result in life-saving, except as a part of a general improvement in sanitary methods.

The Department of Health of New York City states as a fundamental precept that "public health is purchasable; within natural limitations a community can determine its own death rate." Communities have been slow to recognize this truth, but that there is a rapidly growing recognition is known to any student of civic sentiment. In the United States the increase in interest in matters pertaining to child welfare has been marked in the past five years. Possibly in no other line of public-health work has such an advance in interest been made, and of the various efforts made to conserve the health of children "baby saving" has made the most direct public appeal. The most impressive and significant impression made by attending a meeting of our national "Association for the Study and Prevention of Infant Mortality" is the various classes of people represented—physicians and trained nurses, teachers and students, social workers, philanthropists, clergymen, clubwomen, Government officials, and laymen, meeting on the common ground of that great human appeal—life-saving. It is this awakening of the public mind, this catholic interest, that causes even the most crowded of newspapers to print infant-mortality statistics as "news," and the magazines to publish leading articles on baby-saving campaigns, that has made possible the "purchasing of public health," and the saving of thousands of otherwise doomed babies.

While this movement has been felt in all civilized countries, it has expressed itself in such a concrete form in New York City that the methods used and the results achieved are in themselves the excuse for confining the consideration of this complex problem to a purely local aspect.

The specific interest in the welfare of children to be considered as an age group was crystallized in the summer of 1908 by the formation of the division of child hygiene of the department of health to control all public health matters affecting children from birth to puberty. The reduction of infant mortality forms one of the most important duties of the division. In order to judge the value of the methods employed, a study of the infant death rate for the past 10 years is of interest.

In 1902, this death rate was 168 per 1,000; in 1907, it was 160; the intervening years showed slight variations. In 1908, with the generous appropriation for the division, it was possible to begin the plan of preventive work in baby saving which has since been broadly elaborated. The first year's work showed a death rate of 144 per 1,000, a reduction of 16 points. During that and the succeeding two years, it was possible to carry on the work from May to the middle of September. The members of the board of estimate, New York City's money-appropriating power, were not yet sufficiently impressed by the need of an all-year-round campaign, although the department urged its necessity. During 1909 and 1910, a further reduction of 10 points was made in the death rate. In the latter year, a child-welfare exhibit brought the matter fairly to the attention of the public, and for 1911 an appropriation was made sufficient to allow the establishment of 15 infants' milk stations, to be maintained throughout the year. Early in the spring of the same year, the New York Milk Committee, a private organization, formed to forward civic interests along its specified lines, and, in a spirited campaign led by Mrs. J. Borden Harriman, raised sufficient funds by private contribution to open 31 infants' milk stations to work in cooperation with the department of health and demonstrate the value of this method of reducing infant mortality, the avowed intention being to maintain the stations until the city would provide for their support. These stations, together with those of the department of health, the New York Diet Kitchen Association, Nathan Straus, the Brooklyn Children's Aid Society, Babies' Dairies, Morningside Milk Dispensary and Nurses' Settlement, gave a total of 79 stations for the city. These were soon combined in an Association of Infants' Milk Stations, with uniform methods of record keeping, reporting to a central office, and full cooperation, with elimination of duplication of effort.

The division of child hygiene, supplementing and cooperating with the stations, had 157 trained nurses making home visits to babies out of reach of the stations. Each nurse was furnished, from the birth records of the department, with the names and addresses of 150 babies in the poorer congested quarters of the city. The names were transmitted to the nurse daily, immediately upon receipt of the notification of the birth, until the full quota had been assigned. Each nurse was wholly responsible for the babies under her control from May 1 to September 15. With 16,987 babies under the care of the district nurses, and 11,644 under the supervision of the stations, a total of 28,631 babies were under direct control.

A campaign of wide publicity was carried on through the newspapers. Printed educational matter was freely distributed, lectures delivered to mothers, at weekly intervals, at over 100 suitable places throughout the city, and the aid of over 20,000 girls from 12 to 14 years of age was enlisted and made of practical value by the formation of "little mothers' leagues."

These leagues are still one of the most important branches of our work. The girls are taught all practical methods of baby hygiene and feeding. The potential value of training young girls for intelligent motherhood is not only of immense importance, but the immediate results have been striking in the improved care that is given to the babies who are directly under the care of these young girls. As true preventive work, it ranks of first importance in the prevention of infant mortality in this and the next generation. In all, 239 of these leagues were formed in 1911, and practically an equal number have been organized this year. Weekly meetings are held for instruction. Each league is under the supervision of a doctor and a nurse from the division of child hygiene.

Weather conditions during the summer of 1911 were unfavorable. The intensity and continuous duration of the heat were more marked than that recorded for any summer since 1901. At the end of the year there were recorded 1,182 fewer deaths under 1 year of age than for the previous year. This reduction took place between the dates of June 15 and September 15, and of the total reduction 954 represented the decrease in deaths from diarrheal diseases, the class of cases against which practically the whole force of the movement had been exerted.

The experiment was carefully followed by public-spirited citizens. The board of estimate, composed of men keenly alive to and in sympathy with movements tending toward increased efficiency in civic welfare, appropriated for use in 1912 sufficient funds to establish 40 additional infants' milk stations, giving a total of 55 under the control of the division of child hygiene of the department of health. The intelligent generosity of the city government exemplified the truism that "public health is purchasable," with the recognition that infant mortality is a public-health problem, and that it is the duty as well as the privilege of the government to assume, in a broad sense, the responsibility of this most important sanitary problem. Enough additional money was appropriated to increase the staff of nurses, so that increased registration at the milk stations might be adequately handled. The force of district nurses was also augmented.

At present one nurse and an assistant are assigned to each station during the entire year, with an additional nurse and assistant from May 1 to October 1, leaving a total of 200 nurses, including a supervising force, available for district visiting in the care of babies for the summer months. One physician is detailed to each three stations, except during the summer, when each station has the continuous service of one physician. In all, 130 physicians are employed for station assignments and for supervisory work in cooperation with the nurses in caring for delicate or ill babies in their homes.

While the reduction in the infant death rate for 1911 had been extremely gratifying, it was evident, from an analysis of the statistics of former years, that definite conclusions as to the actual value of the methods employed could not be accepted without qualification when based upon the results of one year's activity. The year 1912 was therefore viewed with some trepidation. The New York Milk Committee and the Brooklyn Children's Aid Society, feeling that they had demonstrated the value of infants' milk stations in baby saving, and with the conviction that the municipality should assume full responsibility for the infant-mortality problem, withdrew from the field, thus closing 38 stations, the 40 new ones opened by the city giving a net gain of only two to not only hold the gain in the reduction in the death rate, but, if possible, to make this gain greater.

The grouping of the infants' milk stations in an association served to emphasize the need of still stronger cooperation among the various agencies in the city whose activities brought them into more or less direct contact with infant-welfare work. There are approximately 150 such agencies in New York City, and they have heretofore worked for the greater part quite independently of each other. Duplication of effort in many lines has been encountered, with a resulting great loss in efficiency.

Early this year the executive committee of the Infants' Milk Station Association invited all of the agencies to federate under the title of the Babies' Welfare Association. The response was immediate and enthusiastic. A central office, with an executive secretary, was established at the department of health. An executive committee was formed, with one member to represent each class of interests. Subcommittees were formed, with a membership including representatives from all organizations in the city dealing with the particular form of baby-welfare work of the special committee.

The subcommittee on milk stations has as its province the study of the present stations for the purpose of producing more complete cooperation among the various organizations, widening the influence of the stations, and broadening their work of relief. It has divided the city into milk-station districts, assigning one district to each station, so that the old trouble of overlapping and proselyting between milk-station organizations has been practically eliminated. At the same time these districts are to be used as a basis for recommendations as to the establishment of new milk stations. This committee is also cooperating with the committee on hospitals in working out a uniform policy governing the treatment of sick cases at the milk stations and with the committee on social service in solving relief problems. The committee is endeavoring, as far as possible, to establish uniformity of method in the stations of the various organizations and to bring about closer relations between the stations and other agencies.

The subcommittee on hospitals and dispensaries has established a central bureau to furnish daily information regarding available facilities in hospitals, dispensaries, and nurseries and to act as an agent in placing babies referred to it by any agency in the field. Reports have been received and tabulated from nearly 50 hospitals handling baby cases, showing how many beds are available in each institution and what the conditions are for admission. Hospital cases at the milk stations are referred directly to the executive secretary at the central office. He has merely to refer to his records to locate the nearest hospital which is likely to have an available bed on that particular day and without loss of time makes arrangements for receiving a baby. Under the old individual system it often took a nurse at a milk station several hours, and sometimes days, to find accommodations for a little patient.

The outing agencies of the city have been similarly treated. Whenever a worker comes across a baby under two years of age needing a fresh-air outing the central office of the Babies' Welfare Association is notified and arrangements are made for receiving the child. This branch of the work is under the direction of the subcommittee on outings. This committee is also considering the problem of establishing playgrounds for little mothers in vacant building lots. It has also taken up the question of establishing temporary shelter for well babies during the sickness of their mothers.

The committee on social service has accomplished an excellent piece of work in solving the problem of emergency milk relief. Hitherto, when a baby suffering from digestive trouble needed pure milk for which it parents could not pay, it has been necessary to report the case in writing to one of the relief societies and await their investigation, which often took a day or more. In the meantime, the baby might need that milk immediately to save its life. That meant that the cost must come out of the nurse's own pocket if the milk were supplied. An arrangement was made with the relief societies this summer whereby a nurse discovering a baby in need of emergency milk relief can call up a relief agency on the telephone, state such facts about the case as she has at hand and, within 15 minutes' time, receive, also by telephone, from the relief agency, a report as to whether it considers the case likely to prove worthy of charity after further investigation. In that case the relief society will pay the cost of supplying the milk while it carries on its investigation in detail. Under this system no worthy relief case is required to suffer from delay, and no nurse is required to take the price of the milk out of her scanty earnings. The distribution of free ice has also been greatly facilitated by this committee. Hitherto free tickets meant for needy families with sick children had been distributed to half a dozen agencies. As many different sets of tickets had to be printed. Now one set of these tickets is sent out by the association to the entire field.

The committee on publicity and statistics acts as a clearing house of information between the members of the association, the beneficiaries, and the public regarding all details of the work of the association. Weekly reports are received at the central office from the milk stations. The central office in turn sends out a weekly statement of mortality records and facts regarding the progress of the work. The substance of these reports is condensed in weekly or semiweekly newspaper stories. Special articles regarding the work have been printed in the Sunday newspapers and magazines. Queries are received constantly from other cities. Perhaps the most important feature of this committee's work is its educational publicity. Leaflets and folders, put in simple language and sometimes translated into Italian and Yiddish, giving information about various phases of the care of babies, have been distributed by the hundreds of thousands through the tenement sections. Pocket cards giving the location of the milk stations have been given to every available person in the city who is in a position to direct needy mothers to the milk stations. Every policeman and park department employee in the tenement sections has one of these cards in his pocket. A series of 12 articles on baby care have been prepared at the request of the committee and printed in the English, Italian, and Yiddish newspapers which have large circulation in the tenement districts.

There is also a subcommittee on central office, which looks after the needs of the central organization, and makes such provision as becomes necessary from time to time for carrying on the work. So far there has been very little need of a treasurer or common fund. The services of an executive secretary have been provided by the New York Milk Committee, and the Russell Sage Foundation has contributed the time of an investigator, who has done some valuable field work for the association this summer. One secret of the success of the association has been the fact that no new appealing body has been thrust into the field. It is the general opinion that the plan is a success, and there seems to be no longer a doubt but that the organization will be a permanent one. Cooperation without amalgamation has been brought about by the association. No organization within it in any way loses its individuality or has its methods of work encroached upon.

With this impetus and cooperation, the work has been carried on by the division of child hygiene substantially along the lines followed in 1911.

At the present time it is estimated that of the 135,000 babies in New York City, 50,000 have mothers who are ignorant of the simplest methods of proper baby care, and who are unable to pay for such advice or for medical treatment in case of illness.

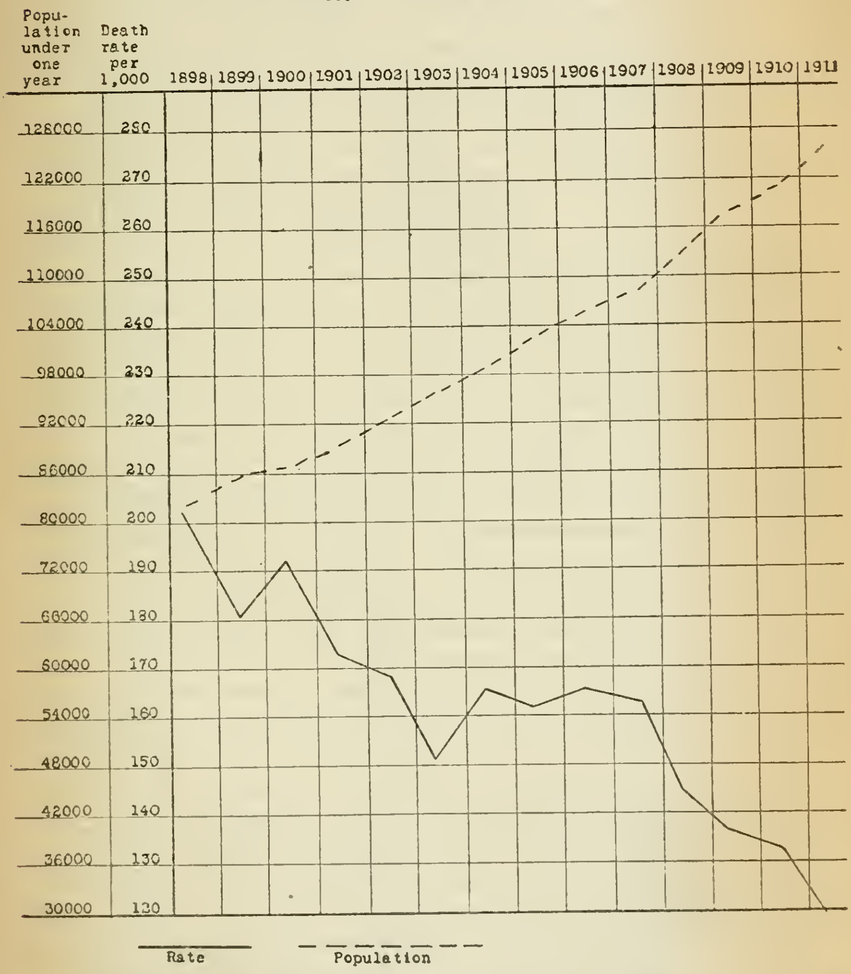
The division of child hygiene has approximately 34,000 of these babies under its control; the allied agencies are caring for about 10,000 of the remainder, leaving an estimated number of 6,000 not yet reached. From January 1 to September 1, 1912, there have been 576 fewer deaths under 1 year from all causes than for the same period of 1911. Four hundred and seventeen of this number represent the decrease in deaths from diarrheal diseases.

Possibly a more graphic method of showing the results of systematic widespread work along preventive lines may be shown by a further study of the mortality statistics. For the four-year period previous to the organization of the division of child hygiene and the assumption by it of the responsibility for the reduction of infant mortality the infant death rate each year showed a numerical increase amounting to a total of 3,026 deaths, while, for the four years since the division was organized, there has been an actual numerical decrease of 2,407 deaths. The death rate for the first-year period, from 1904 to 1907, inclusive, ranged from a maximum of 164 to a minimum of 160 per 1,000. From 1908 to 1911, inclusive, the maximum rate was 144 in 1908, and the minimum was 120 in 1911. In the division's four years of work, this rate has dropped from 160 to 120 per 1,000 deaths from all causes, while the diarrheal death rate has declined from 48.90 to 30.70 in the same period of time.

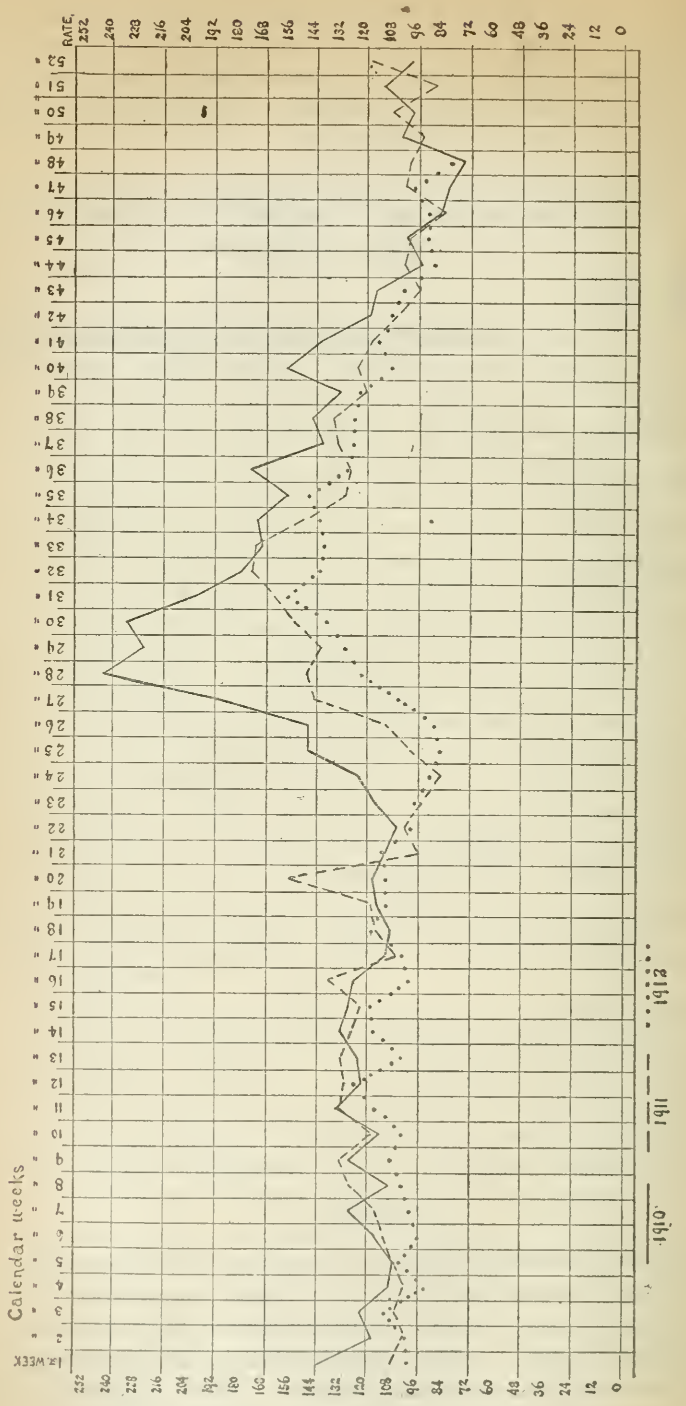
While these results have justified our expectations, we are keenly alive to the importance of further efforts along other lines. The two most important problems to be solved at present are the reduction of infant mortality from so-called "congenital causes" and among institution babies.

In New York City approximately 35 per cent of the deaths under 1 year of age are due to causes mainly dependent upon the health of the mother during her pregnancy and confinement; 32 per cent of the deaths under 1 year occur in the first month of life and 54 per cent in the first three months. This problem is so complex that, even with the most strenuous efforts to solve it, brilliant results can not be expected within the near future. The infants' milk stations, serving as educational centers, are capable of valuable aid. Early registration of pregnant women and continuous supervision following the lines already laid down by various private organizations will show beneficial results, but our whole economic and social structure must be readjusted for ultimate and permanent success. The wide difference between dealing with a few selected cases by a compact private organization, and grappling with the whole situation in a large city by Government action, is obvious; but we intend to vigorously follow up this line of work. These babies suffering from congenital debility furnish the greater number of victims in the annual summer increase in the death rate. They furnish at present the most important factor in the total infant mortality.

CITY OF NEW YORK
POPULATION UNDER ONE YEAR DEATH RATE PER 1,000 UNDER ONE YEAR.
1898 to 1911 inclusive.



However difficult this class of cases may be to deal with, the death rate in institutions for infants is of equal complexity, though seemingly much more simple. The well-known high death rate among illegitimate babies is in part responsible for the appalling statistics furnished by the foundling asylums. These asylums furnish the greater proportion of the infant mortality in institutions of all



NEW YORK CITY.

DEATH RATE IN CHILDREN UNDER ONE YEAR PER 1000 POPULATION AT THAT AGE.

classes, and, in New York, our largest institution of this kind has had a death rate of 50 per cent for the past two years, based on births in the institution and admissions under 1 year of age. Hospitals for sick babies also furnish a mortality which seems excessively high. In 1910 the institution death rate of babies under 1 year of age furnished 42 per cent of the total in the Borough of Manhattan of New York City.

This condition is being met in part by the boarding out of a proportion of the foundling babies in private homes, under the supervision of doctors and nurses of the division of child hygiene. This supervision is neither as far-reaching nor as effective as it should be, owing to the institutional rules; but excellent results have been obtained from even this imperfect system. The attempt to raise babies wholesale is a failure, and individual care for them offers the easiest and quickest method of life saving.

The evolution of the infants' milk stations is essential. Pure milk, however desirable, will never alone solve the infant-mortality problem. Under our system of home visiting to instruct mothers in the care of babies we have demonstrated that babies may be kept under continuous supervision at a cost of 60 cents per month for each baby, and the death rate among babies so cared for by us has been 1.4 per cent. The death rate among the babies under the care of the milk stations has been 2.5 per cent, and the cost $2 per month per baby. Without overlooking the value of pure milk, I believe that this problem must primarily be solved by educational measures. In other words, that the solution of the problem of infant mortality is 20 per cent pure milk and 80 per cent training of the mothers. The infants' milk stations will serve their wider usefulness when they become educational centers for prenatal instruction, the encouragement of breast feeding, and the teaching of baby hygiene. The mother will be instructed to buy the proper grade of milk at the place most convenient to her home.

With these next steps still to be taken New York City has already demonstrated that infant mortality is a public health problem, that it should and can be effectively dealt with by a properly organized department of health, and that money wisely expended buys public health as readily as it does any commodity. In the largest city, with the most complex population in this country, in a city where poverty and congestion of population are exemplified in their worst forms, where immigration furnishes a rushing tide that knows no ebb, and where the resulting economic and social conditions baffle our most advanced students of civic problems, we have demonstrated that the door of hope is open to the littlest of our citizens and that, under the worst conditions, it is possible to solve at least a part of the infant-mortality problem. Our cities are learning that "it is not the babies that are born but those that are saved that count."

Table showing deaths and death rates of children under 1 year of age, based on the estimated population at that age.

Year.	All causes.		Diarrheal diseases.	
	Deaths.	Rate.	Deaths.	Rate.
1902	15,526	168	4,090	44.28
1903	14,413	151	3,769	39.56
1904	16,125	164	4,726	48.08
1905	16,522	163	4,945	48.75
1906	17,188	164	4,943	47.08
1907	17,437	160	5,314	48.90
1908	16,231	144	5,118	45.45
1909	15,976	137	4,254	36.45
1910	16,212	134	5,807	47.97
1911	15,030	120	3,853	30.70
1912 (to Sept. 1)	9,868	113	2,218	25.47

DISCUSSION.

Miss MINNIE H. AHRENS, superintendent, Infant Welfare Society, Chicago, Ill.: In the year 1910 an average of 2,000 bottles of milk were prepared daily according to standard formulæ. To-day all milk is delivered in the home and the mother is taught to prepare it according to formulæ made out by the physician.

Dr. F. DUFFIELD: We have in Detroit in the summer several very hot days, with a high relative humidity, and then a cool spell. If one watches the death certificates at this time one is struck with the number of deaths due to prematurity. As the weather cools the prematurities lessen.

Again, a large number of death certificates marked "cholera infantum" are found on investigation to be really "infantile atrophies," with an acute diarrhea as the immediate cause of death.

Dr. THOMAS F. HARRINGTON, Boston, Mass.: In a study of infant mortality, carried out for a long series of years in one of the largest cities in this country, I observed that there was a constant ratio between the temperature during May and June to the infant mortality in July, August, and early September. A high general temperature during May and June was followed by a higher infant mortality in the summer months than was evident when May and June were cool, even though the summer months were much warmer than in other years. The reverse was equally evident, i. e., a cool May and June gave a low infant mortality, irrespective of the average temperature during July, August, and September. My contentions are that the resistant force of the infant is destroyed by the warm early months, so that when the warm, humid days of July and August overtake the infant the tide is easily against the infant, hence the high mortality.

G. J. Holmes, Newark, N. J.: I congratulate Dr. Baker on her excellent paper. She did not mention, however, where the stations are located. I would like to urge that the public school building be used, and that these stations be located in such buildings. I know of no better use to which to put a classroom. Public schools should be for the education of adults as well as children. I would suggest that this educational work be made a part of medical inspections of public schools, and that the medical inspectors and school nurse give the instruction. Instruction in baby hygience should be made an important part of the public school course for girls from 12 to 16 years of age. The location of the stations in the public school buildings affords actual living material for instructing the young girls during the course of instruction. Here would be an ocular demonstration from this instruction.

The cost of establishing these stations and maintaining them would be lowered by using public buildings.

We have established, in a public school in the city of Newark, N. J., such a clinic where parents are instructed in the feeding, bathing, clothing, and general care of the babies. Advantage, however, is not taken of this opportunity to instruct the young girls.

L. T. Royster, M. D., Norfolk, Va.: There are, of course, many causes which combine to produce that symptom complex known as summer diarrhea. The studies of Lieffmann and Lindemann, to which allusion has been made, are apparently quite conclusive. I had the pleasure of studying this question during the past year for this country. The paper was read before the American Medical Association at the Atlantic City session. I feel that the mere incidence of heat alone does not produce the trouble, but, rather, a lack of radiation. Therefore, I feel assured that humidity plays its own part in the matter. The German authors already quoted state that a relative humidity of 50 per cent is high. In this country there are few cities which do not average much higher than this. In fact, from 70 to 90 in many instances at the critical period of the year. Those of us who are familiar with conditions on the seashore well know how we can take a child who has had a bad diarrhea the previous day, apparently from the heat, and send that child out on the water, and by night the cheeks will be filled out and the eyes less sunken. This is in spite of the fact that the heat is frequently as great on the water as on land, and the humidity greater, but on the water there is always a breeze, hence the radiation is greater. This is also true in the intensely hot parts of the West. I am told that summer there is the healthiest time of the year for children, with a temperature often above 100° (we could not live at such temperatures on the coast), but at this time the relative humidity is frequently as low as 4 per cent. Hence the radiation is exceptionally great.

Dr. IRA S. WILE, New York, N. Y.: The parental care, as found in the experience of the New York Milk Committee, may reduce the mortality from congenital causes by 50 per cent.

The relation of milk and education at the milk stations represents not alone the 20 per cent and 80 per cent referred to by Dr. Baker, but appears to be that of bait and opportunity. The New York Milk Committee has had centers of hygiene without milk dispensation, and the results have been equal to those gotten at milk stations, as far as the babies are concerned. There was not as large a number of mothers attracted to the educational center without the milk dispensations as with it.

The midwives are a factor in 45 per cent of the births of New York City, and their relation to the subject deserves further study, but a later session will discuss this topic.

The milk stations that dispense milk in bottles according to definite formulæ fail to recognize the educational value of such an institution. The mother must be taught to prepare the food, though offering whole milk makes an attractive bait.

DIE BEKÄMPFUNG DER ANSTECKENDEN KINDERKRANKHEITEN.

Dr. WALTHER EWALD (Bremerhaven).

Die ansteckenden Krankheiten haben seit einigen Jahrzehnten alle Schrecken verloren, seitdem es gelungen ist, mit den Waffen der Hygiene und der Seuchenbekämpfung ihnen erfolgreich zu begegnen und sie immer mehr zurückzudrängen. Bei einer Krankheit wie den Pocken, die früher in endemischer Verbreitung überall auf der Erde vorkamen, ist es gelungen, ganze Länder seuchenfrei zu halten und sogar die Bevölkerung des Landes wie in Deutschland gegen diese furchtbare Seuche zu immunisieren. Andere Krankheiten, wie Pest und Cholera, deren Nahen früher banges Entsetzen hervorrief, machen an der Grenze der zivilisierten Länder Halt, obwohl sie in Asien und Afrika in derselben Ausdehnung wie früher verbreitet sind, und wenn einmal ein Krankheitsfall eingeschleppt wird, so kann er doch eine Allgemeininfektion nicht bewirken und wird schnell unschädlich gemacht. Wenn wir in allen Kulturländern immer wieder derselben Erscheinung begegnen, dass die Sterblichkeit im Laufe der letzten Jahrzehnte gesunken ist, so müssen wir diese Verlängerung der durchschnittlichen Lebensdauer hauptsächlich darauf zurückführen, dass es gelungen ist, die Infektionskrankheiten mit Erfolg zu bekämpfen, dass die grossen tropischen Seuchen, wie Pest, Cholera, Lepra bei uns keinen Boden mehr finden, und dass die endemischen Seuchen wie Rückfallfieber, Flecktyphus, Typhus und

andere mehr erheblich zurückgedrängt sind und die allgemeine Sterblichkeit daher nicht mehr beeinflussen können.

Eine Ausnahme von dieser Erscheinung findet sich nur bei einer Gruppe von Infektionskrankheiten, die zwar weder klinisch noch durch die Aetiologie zueinander gehören, die aber dadurch miteinander verbunden sind, dass sie hauptsächlich nur das Kindesalter befallen und darum auch zu den typischen Kinderkrankheiten gerechnet werden; es sind hauptsächlich Masern, Scharlach, Keuchhusten und Diphtherie und in geringerer Bedeutung die epidemische Genickstarre, die Kinderlähmung, die Malaria und andere Infektionskrankheiten. Die echten Kinderkrankheiten zeichnen sich dadurch aus, dass sie bei gleich grosser Verbreitungsmöglichkeit ausschliesslich oder hauptsächlich nur Kinder befallen. Es erkranken auffallend viel Kinder, von denen auch eine Anzahl sterben; je älter die Kinder sind, um so weniger zahlreich sind die Erkrankungsfälle. Auch die Erwachsenen sind nicht gegen die Erkrankung gefeit; aber ihre Erkrankungshäufigkeit ist verschwindend gering. Der grossen Erkrankungsziffer besonders der jüngeren Kinder steht häufig eine geringe Letalität gegenüber, während die Letalität der jugendlichen Personen und der Erwachsenen viel grösser ist. Die epidemische spinale Kinderlähmung ist eine echte Kinderkrankheit. In einer Tabelle, in der die bei der grossen Epidemie in Schweden beobachteten Fälle nach der prozentualen Verteilung der Altersklassen dargestellt sind, sind die Krankheitsfälle durch die gezackte, die Todesfälle durch die schwarze Linie gekennzeichnet. Es handelt sich um eine typische Kinderkrankheit; denn hauptsächlich sind es die jüngsten Altersklassen, die von der Krankheit ergriffen werden. Die gezackte Kurve beginnt deshalb ziemlich hoch und fällt schnell ab. Die Mortalitätskurve verläuft gerade umgekehrt, so dass beide Kurven sich scherenförmig kreuzen. Es erkranken viele Kinder, von denen aber nur wenige sterben. Er erkranken wenig Erwachsene, die denn auch häufiger der Krankheit erliegen.

Echte Kinderkrankheiten sind die Diphtherie und der Keuchhusten, die auch bei Erwachsenen vorkommen, aber hauptsächlich die jüngsten Altersklassen befallen. Eine echte Kinderkrankheit ist auch die übertragbare Genickstarre, die zu 75–85 Prozent Kinder unter 15 Jahren befällt.

Nun gibt es aber Infektionskrankheiten, die den Genesenen gegen eine spätere Wiederinfektion immunisieren. Treten solche Krankheiten endemisch auf, so befallen sie nur diejenigen Personen, die noch nicht die Krankheit gehabt haben, und das sind die Kinder. Es erweckt dann den Anschein, als ob eine echte Kinderkrankheit vorliegt. Unter diesem täuschenden Bilde der Kinderkrankheit sind früher die Pocken allegemein aufgetreten. Und auch heute haben wir in den Masern eine derartige Krankheit, die, ohne zu den echten Kinderkrankheiten zu gehören, doch bei ihrer endemischen Verbreitung ausschliesslich Kinder befällt. Aber wenn einmal die Masern eine bis dahin nicht betroffene Völkerschaft befallen haben, dann sind auch ihre Verheerungen in allen Altersklassen furchtbar gewesen. So wurden ganze Stämme der Eingeborenen an den Ufern des Amazonenstroms 1749 hingerafft und die Zahl der der Seuche Erlegenen wird auf 30,000 veranschlagt. In Astoria fiel 1829 fast die Hälfte der Eingeborenen der Krankheit zum Opfer. Und dasselbe ereignete sich 1846 under den Indianern der Hudson-Bay-Länder, 1852 unter den Hottentotten im Kaplande, 1854 und 1861 unter den Eingeborenen von Tasmania und 1874 auf Mauritius und den Fidschi-Inseln. Man wird schon hieraus entnehmen können, dass diese Krankheit sich in verschiedener Weise von den echten Kinderkrankheiten unterscheiden wird.

Im allegemeinen ist die Anschauung verbreitet, dass die infektiösen Kinderkrankheiten recht harmloser Natur seien und höchstens der Scharlach und die Diphtherie durch heimtückische Komplikationen zahlreichere Opfer fordern. Infolgedessen ist bisher auch nichts in der Bekämpfung der Kinderkrankheiten geschehen ganz im Gegensatz zu den Massnahmen gegen die Infektionskrankheiten, die hauptsächlich die Erwachsenen befallen. Das ist aber eine irrige Meinung. Es starben z. B. in Deutschland im Jahre 1910 an Typhus 2,500 Menschen, an Influenza 7,500 und an allen anderen Infektionskrankheiten zusammen ausser Tuberkulose und Lungenentzündung 11,500 Personen. Dagegen betrug die Sterblichkeit—

An Scharlach	7, 000
An Masern und Röteln	11, 000
An Keuchhusten	14, 000
An Diphtherie	14, 500
Zusammen	46, 500

Die Kinderkrankheiten fordern also weit mehr Opfer als die anderen Infektionskrankheiten zusammen, und unter ihnen ist nicht etwa der Scharlach am gefährlichsten. wie gewöhnlich angenommen wird, sondern der Keuchhusten und die Diphtherie, und selbst Masern und Röteln fordern mehr Opfer als der so gefährlich erscheinende Scharlach. Im Jahre 1906 und 1908 übertraf übrigens der Keuchhusten mit 18,000 resp. 16,000 Fällen sogar die Diphtherie, während bei den andern Krankheiten zwar auch die Zahlen schwanken, aber dasselbe Verhältnis erhalten bleibt. Jede einzelne der Kinderkrankheiten übertrifft die sonst so gefürchteten Seuchen und selbst die gefährliche Cholera konnte in Deutschland bei ihren beiden letzten Einfällen 1892 und 1905 nur 8573 resp. 88 Todesfälle veranlassen. Die ausserordentliche Verbreitung der infektiösen Kinderkrankheiten ist nun aber nicht etwa nur für Deutschland charackteristisch, sondern trifft überhaupt für Europa und überhaupt wohl für die ganze zivilisierte Welt zu. Es ist natürlich bedenklich, in den verschiedenen Staaten die Sterblichkeit an den einzelnen Krankheiten in Vergleich zu setzen; denn überall ist die Art der Erhebungen verschieden. Besonders wird aber die Statistik auch dadurch beeinflusst, dass in verschiedenen Ländern Nachkrankheiten verschieden rubriziert werden, so Lungenentzündung nach Masern bald als Lungenentzündung, bald als Masern oder Nierenentzündung bei Scharlach bald als Nierenentzündung, bald als Scharlach. Auch die Verschiedenheit des Kulturzustandes, der Bevölkerungsdichtigkeit, des Vorwiegens der städtischen oder ländlichen Bevölkerung bringt Differenzen mit sich, die die statistische Verleichung erschweren müssen. Wenn man sich jedoch nicht an die absoluten Ziffern hält, sondern nur einen Vergleich dafür haben will, ob denn tatsächlich die infektiösen Kinderkrankheiten überall noch eine so wichtige Rolle spielen, so wird man immerhin mit einiger Reserve eine solche Untersuchung auf die verschiedenen Länder ausdehnen können. Ich bringe nachfolgend eine Tabelle, in der eine Anzahl von Staaten und Städtegruppen Europas auf das Vorhandensein der Kinderkrankheiten verglichen werden. Von je 100,000 Einwohnern starben an folgenden Krankheiten:

	Jahr.	Einwohnerzahl in Tausend.	Scharlach.	Masern und Röteln.	Diphtherie.	Keuchhusten.
Staaten:						
Deutsches Reich	1908	62,112	17.4	17.1	24.0	26.4
Schweiz	1908	3,555	4.1	6.4	15.9	13.8
England und Wales	1909	37.757	9.0	35.4	14.6	20.1
Belgien	1908	7,386	16.3	40.4	16.6	36.2
Niederlande	1909	5,857	3.0	16.6	7.8	17.1
Russland	1909	[1] 64.827	153.4	129.6	89.6	104.9
Städtegruppen:						
Die 349 grössten Orte des Deutschen Reichs	1909	22.890	17.6	17.7	24.0	17.3
18 grosse städtische Gemeinden der Schweiz	1908	887	4.7	10.9	15.6	13.3
72 Städte Frankreichs mit mehr als 30,000 Einwohnern	1908	8.269	6.3	15.8	10.1	7.6
76 grosse Städte Englands	1909	16,445	11.1	47.5	14.6	23.5
75 Städte Danemarks	1909	1,078	10.4	11.6	9.2	26.0
49 Städte Spaniens	1909	3.330	6.1	31.2	24.8	11.0
74 Städte Belgiens	1909	2.823	7.2	27.0	9.5	7.8
32 Städte Rumaniens	1909	996	72.1	4.8	16.8	3.7

[1] Ca. 48.9 Prozent der Gesamtbevölkerung.

So sehr diese Ziffern auch unter sich abweichen mögen, so zeigen sie doch, dass überall in Europa die übertragbaren Kinderkrankheiten eine ganz besondere Bedeutung in der Todesursachenstatistik haben, und dass im allgemeinen Masern und Röteln mehr Opfer fordern als der Scharlach, der Keuchhusten mehr als die zur Zeit ziemlich milde auftretende Diphtherie.

Die Mortalität dieser Krankheiten stellt aber nur einen Faktor ihrer volkswortschaftlichen Bedeutung dar, der besonders greifbar vor Augen tritt. Nicht so deutlich, aber nicht minder bedeutend ist der Faktor, der in anderer Weise auf das Nationalvermögen, das in diesen jungen Menschen steckt, schädigend einwirkt. Wir wissen nämlich, dass alle diese Krankheiten sich häufig mit anderen Krankheiten komplizieren und dadurch schwere Nachteile auch für das Kind mit sich bringen können, das nun nicht gerade der Krankheit erliegt. So führt die im allgemeinen ja seltener auftretende speziale Kinderlähmung nicht so oft zum Tode als vielmehr zu einer mehr oder minder starken Verkrüppelung. Die Meningitis tritt zwar mit einer Letalität von 60–70 Prozent auf, aber diejenigen, die mit dem Leben davonkommen, behalten meist irgend ein Gebrechen zurück: Schwerhörigkeit, Sprachfehler. Taubstummheit, Geistesschwäche, Augenfehler und Lähmungen. Der Keuchhusten ist weniger an sich gefährlich als dadurch, dass er eine Disposition zur Tuberkulose schafft, die erst nach Jahren zum Ausbruch kommt und so die verspätete Folge der Kinderkrankheit darstellt. Jedes 4. und 5. Kind erkrank bei Scharlach an Ohrenleiden, die oft Jahre lang bestehen und einen mehr oder minder starken Hörverlust bedingen können. Nicht ebenso häufig, aber häufiger, als man gemeinhin denkt, ist dieselbe Erscheinung bei den Masern. In Deutschland sind 15 Prozent der taubstummen Kinder, die in Anstalten untergebracht sind, im Verlaufe des Scharlachs ertaubt, 6.1 Prozent bei Masern, 2.6 Prozent bei Diphtherie, 9 Prozent bei epidemischer Genickstarre. Nach Masern bleiben oft katarrhalische Zustände bestehen, die monate- und selbst jahrelang anhalten können und eine hohe Tuberkulosegefährdung mit sich bringen. Bei Scharlach sind Nierenleiden und Herzkrankheiten eine häufige Folge. In vielen Fällen wird aber eine Kinderkrankheit nicht zu einen ausgesprochenen chronischen Lieden führen. sondern Folgen hinterlassen, die sich in Schwächlichkeit, Zartheit der Organe und Herabsetzung der Gesamtkonstitution äussern.

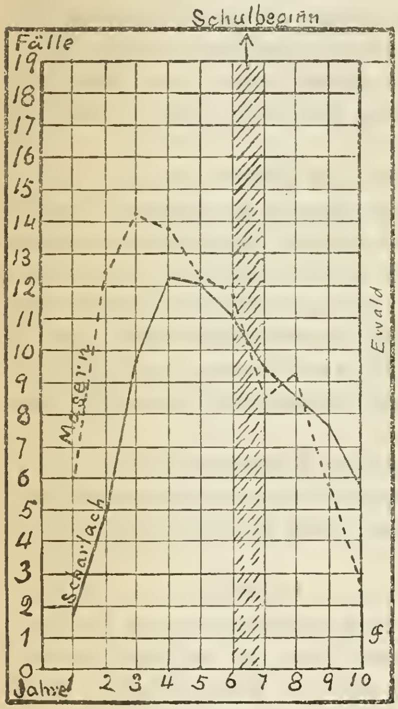
Angesichts dieser Sachlage muss man zu der Ueberzeugung kommen, dass die Bekämpfung der übertragbaren Kinderkrankheiten bis jetzt ausserordentlich vernachlässigt worden ist, wenn man überhaupt von einer Bekämpfung sprechen kann. Wenn in fast allen Ländern ein Rückgang in der Sterblichkeit bei Scharlach, Diphtherie und zum Teil auch bei Keuchhusten erfolgt ist, so ist diese Frucht uns ohne unser besonderes Darzutun in den Schoss gefallen und lediglich den Fortschritten der allgemeinen Hygiene zu verdanken, die aber fest gänzlich bei den Masern versagt hat. Ein aktives Vorgehen ist bisher nirgends erfolgt und wenn man versucht hat, diesen Krankheiten mit denselben Waffen der Seuchenbekämpfung zu begegnen wie bei der Pest, der Cholera und dem Typhus, so hat man sich überzeugen müssen, dass irgend ein greifbarer Nutzen dabei nicht herausspringt, sondern dass diese Aktion ein Schlag ins Wasser war. Es ist unbedingt notwendig, die Bekämpfung der übertragbaren Kinderkrankheiten in besondere Bahnen zu lenken, die den Eigentümlichkeiten dieser Krankheiten auch gerecht werden.

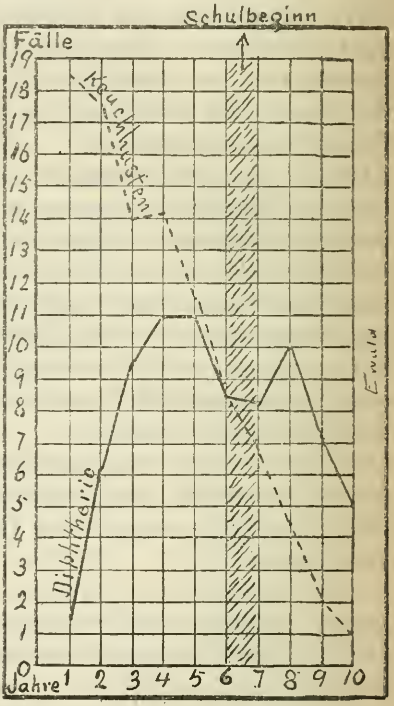
Ein systematisches Vorgehen gegen diese Krankheiten ist nur möglich, wenn man den Ursachen ihres Auftretens und den Wegen ihrer Verbreitung nachgeht, ebenso wie die Bekämpfung des Typhus nur dadurch ermöglicht worden ist, dass man die Erreger kennen lernte und fand, dass er durch Gegenstände, durch Wasser, durch Milch, durch andere Nahrungsmittel und schliesslich gar durch gesunde Menschen, durch Bazillenträger verbreitet wurde. Bei den übertragbaren Kinderkrankheiten ist man, wenn man von Genickstarre und Keuchhusten absieht, nicht so gut daran, da man den Erreger nicht kennt. Man muss daher auch die bakteriologische Komponente bei der Bekämpfung dieser Krankheiten vernachlässigen oder kann doch wenigstens nach dieser Richtung einen wirklichen Kampf nicht aufnehmen.

Bei der heutigen Sachlage muss man die Masern als eine unvermeidbare Krankheit ansehen und nur danach zu trachten suchen, dass ihre schlimmen Folgen abgelenkt werden, bei allen andern ansteckenden Kinderkrankheiten handelt es sich dagegen um vermeidbare Krankheiten, denen man daher auch mit grösster Energie entgegentreten muss, um ihre Verbreitung zu verhindern oder gar ihr Aufkommen unmöglich zu machen. Es wird daraus eine beachtenswerte Verschiedenheit in dem aktiven Vorgehen und in dem Ziel, das man sich setzt, resultieren.

Zunächst sollen einige charakteristische Eigentümlichkeiten hervorgehoben werden, die den Kinderkrankheiten gemeinsam sind. und die darum auch eine gewisse Gleichartigkeit bei der Bekämpfung ermöglichen.

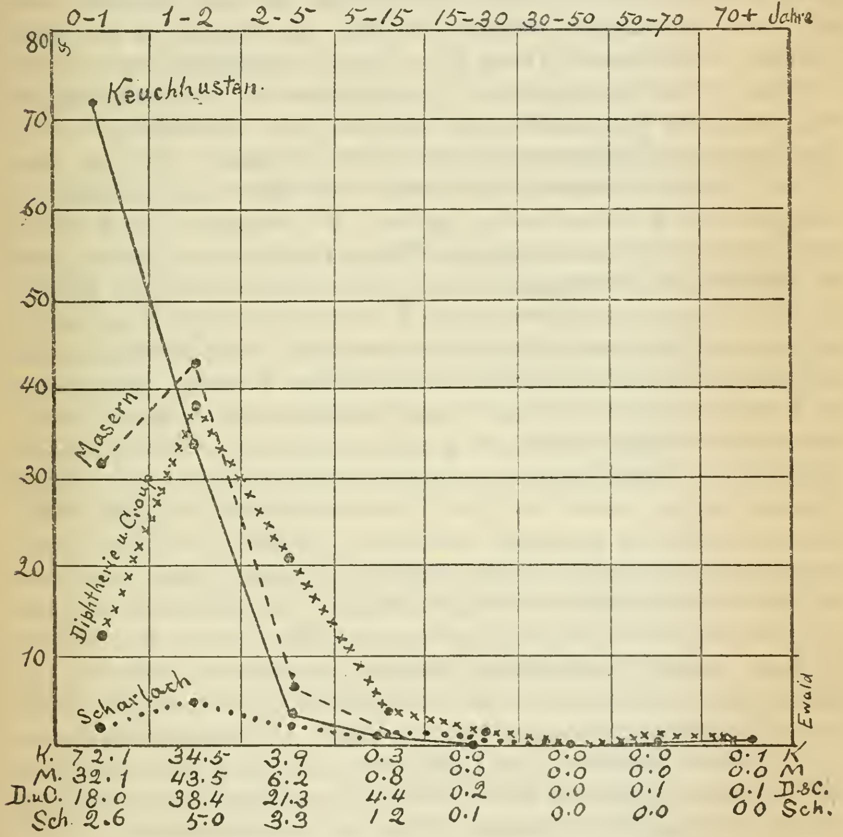
Alle 4 Krankheiten—Masern, Scharlach, Diphtherie, und Keuchhusten—auf deren Besprechung ich mich beschränke, sind dadurch, wie ich schon erwähnte, ausgezeichnet, dass sie bei der heutigen Sachlage fast ausschliesslich das jugendliche Alter befallen, wenn auch bei den Masern dafür andere Ursachen massgebend sind als bei den andern Krankheiten, die durch eine besondere Empfänglichkeit der jugendlichen Personen ausgezeichnet sind. Wenn wir zunächst die Erkrankungshäufigkeit ins Auge fassen, so gibt folgendes Diagramm eine gute Uebersicht über die Verteilung der Krankheiten auf die einzelnen Altersklassen. (Abbildung I.) Die Ziffern selber rühren von Both her. Die prozentuale Erkrankungsfähigkeit, einmal an Masern und Scharlach, das andere Mal an Keuchhusten und Diphtherie, ist für die Altersklassen des Kindesalters dargestellt. Der Raum zwischen dem sechsten und siebenten Lebensjahr, der im allgemeinen den Termin der Einschulung bezeichnet, ist durch eine schraffierte Säule kenntlich gemacht. Masern, Scharlach, und Diphtherie sind dadurch gemeinsam charakterisiert, dass sie das erste Lebensjahr nur wenig befallen, alsdann schnell ansteigen, um im dritten und vierten Lebersjahr ihr Maximum zu erreichen. Darauf fallen sie mehr oder minder steil ab. Masern und Diphtherie zeigen jedoch im achten Lebensjahr einen charakteristischen Gipfel, der wahrscheinlich auf die vermehrte Infektionsgelegenheit infolge des Schulbesuchs zurückzuführen ist. Beim Scharlach macht sich diese Erscheinung nicht bemerkbar, nur scheint die Kurve etwas langsamer abzufallen. Der Keuchhusten tritt ganz entgegengesetzt im ersten Lebensjahr besonders stark auf, und seine Kurve fällt von da ab bis zum zehnten Lebensjahr in ziemlich gleichmässiger Steilheit ab, nur das vierte Lebensjahr zeigt eine kleine Verzögerung, die vielleicht auf die vermehrte Infektionsmöglichkeit durch Kinderhorte und Kindergärten zurückzuführen ist.





Durchaus anders ist das Bild, wenn man dieselben Krankheiten nach ihrer Verteilung auf die einzelnen Altersklassen als Todesursachen betrachtet. Dies geht aus einem Diagramm hervor, das die Sterblichkeit in Bayern während der Jahre 1893–1902 darstellt. (Abbildung II.) Hier ist die Sterblichkeit der einjährigen Kinder am grössten beim Keuchhusten, während bei allen andern Kinderkrankheiten das zweite Lebensjahr dominiert und sich in entsprechender Höhe auch beim Keuchhusten hält. Dann sinkt die Kurve etwas, erreicht aber erst im 6. Lebensjahre geringere Werte, um dann schliesslich nach dem 15. Lebensjahre auf Null oder beinahe auf Null herabzusinken. Die verschiedenartige Beteiligung der Geschlechter kann für unsern Zweck hier ausser acht gelassen werden.

Für die Bekämpfung der ansteckenden Kinderkrankheiten kommen demgemäss zwei verschiedene Momente in Betracht, in erster Linie wird man sich gegen die todbringenden Komponente wenden müssen,



in zweiter Linie wird man die Krankheiten überhaupt zu bekämpfen haben. Beide Aufgaben sind nicht ohne weiteres identisch. Bei den Masern z. B. erscheint es unmöglich, diese Krankheit überhaupt mit Aussicht auf Erfolg zu tilgen; wir müssen immer noch die Masern als eine unvermeidbare Krankheit ansehen, der nur sehr wenige Menschen zu entgehen vermögen, bei den andern Krankheiten könnte schon eher die Bekämpfung der Krankheiten selber eine Aussicht auf Erfolg bieten. Wenn wir zunächst uns gegen die in Frage kommenden Krankheiten als Todesursache wenden, so ist ersichtlich, dass hier in der Hauptsache die Kinderwelt in Frage kommt, soweit sie nicht schulpflichtig ist. Wir sehen, dass bei Masern, Scharlach und Diphtherie die Säuglinge auffallend verschont bleiben.

Diese sehr eigenartige Erscheinung ist wohl darauf zurückzuführen, dass die Kinder infolge ihrer mangelhaften Bewegungsfähigkeit und ihres Aufenthalts in der Wiege oder im Kinderbett keine Gelegenheit haben, mit andern Infektionsträgern zusammenzukommen und sich selten infizieren. Soweit die Säuglinge aber erkranken, haben sie einen gewissen natürlichen Schutz, der wohl hauptsächlich durch die Muttermilch bedingt ist. Bei den Masern ist das ohne weiteres einleuchtend. Denn bei allen Erwachsenen, die Masern überstanden haben, müssen sich Immunkörper im Blut befinden, die nun durch die Muttermilch auf die Säuglinge übertragen werden. Wen daher die Erkrankung aucht nicht verhindert wird, so wird sie doch weniger stürmisch auftreten und daher auch seltener zu Komplikationen Veranlassung geben. Bei Scharlach und Diphtherie werden wohl nur in seltenen Fällen Immunkörper direkt durch die Muttermilch übertragen werden, aber es wird durch die Muttermilch der ganze Gesundheitszustand der Säuglinge gehoben, und es werden vielleicht auch allgemein schützende Stoffe übertragen, die mildernd auf den Krankheitsverlauf einwirken können. Sobald aber die Ernährung durch die Mutterbrust auhört, was Ende des 1. Lebensjahres oder zu Beginn des 2. zu geschehen pflegt, so tritt die tödliche Wirkung der Krankheiten in auffallender Weise zutage. Aus andern Untersuchungen wissen wir, dass die Sterblichkeit an ansteckenden Kinderkrankheiten in einem bestimmten Verhältnis zu der Wohlhabenheit steht, derart dass in ärmeren Gegenden oder Stadtteilen die Sterblichkeit höher ist als in reicheren. Eine besondere Gefährdung besteht für diejenigen Kinder, die an Rhachitis leiden; sie sind in ihrer ganzen Konstitution derartig geschwächt, dass sie den ansteckenden Krankheiten keine ausreichenden Abwehrmittel gegenüberstellen können und daher häufig erliegen. Wenn man den Krankheiten Masern, Scharlach und Diphtherie als Todesursachen begegnen will, wird man in erster Linie darauf hinzuwirken haben, dass das Stillgeschäft möglichst in allen Fällen und hinreichend lange durchgeführt wird, da die Mutterbrust den Säuglingen einen ausgezeichneten Schutz nicht vor der Ansteckung, aber wohl vor den Folgen dieser Krankheiten gewährt. Man wird dann weiterhin alle Massregeln begrüssen müssen, die der Bekämpfung der englischen Krankheit und der Wohnungsfürsorge dienen, da auch hierdurch ein gelinderes Auftreten der ansteckenden Kinderkrankheiten gewährleistet wird.

Ganz anders liegen die Verhältnisse beim Keuchhusten. Je jünger das Kind ist, um so leichter wird es angesteckt, je jünger es ist, um so leichter erliegt es auch der Krankheit. Man wird hieraus die Nutzanwendung ziehen müssen, dass allen Massnahmen zur Verhütung der Ansteckung hier eine ganz andere Bedeutung zuerkannt werden muss, als das bisher gemeinhin geschah. Was für den Keuchhusten überhaupt und dabei in erster Linie für das 1. Lebensjahr gilt, das hat aber dieselbe Berechtigung bei den andern Krankheiten vom 2.–5. Lebensjahre. Eine jeder neue Krankheitsfall schafft bei dieser Alterklasse eine grosse Wahrscheinlichkeit für einen unglücklichen Ausgang, und je jünger das betroffene Kind ist, um so grösser ist das Risiko. Man unterschätzt gemeinhin in ärztlichen Kreisen die grosse Gefahr, die den jüngeren Familienmitgliedern durch die Ansteckungsmöglichkeit entsteht. Der praktizierende Arzt denkt in erster Linie an die Gesundung seines Patienten und in zweiter Linie erst, wenn überhaupt, an die ausreichende Isolierung. Wenn irgendwo, so ist gerade hier der Satz zu beherzigen: Krankheiten verhüten ist besser, denn Krankheiten heilen. Wenn sich ein Kind von etwa 8 Jahren in der Schule Masern holt, so ist das an sich ganz unbedenklich. Gefährlich ist aber die Infektionsgefahr, die damit den jüngeren Geschwistern droht, und die Todesgefahr, die um so grösser ist, je jünger die Geschwister sind. Und was für die Masern gilt, das hat auch für die andern Kinderkrankheiten entsprechend Geltung. In den meisten Fällen ist eine ausreichende Isolierung der Erkrankten in der Familie nicht möglich. Es müssen daher Gelegenheiten geschaffen werden, solche Isolierungen in anderer Weise zu erzielen. Das kann dadurch geschehen, dass die kranken Kinder in Krankenhäuser überführt werden.

So probat dieses Mittel in der Theorie sein mag, so oft versagt es in der Praxis. Man kann einer Mutter schlecht zumuten, dass sie ihr schwerkrankes Kind aus dem Hause und in fremde Hände gibt, und tatsächlich weigern sich denn auch die Mütter beharrlich und nur dort gelingt es, die Kinder in Krankenhäuser zu bringen, wo entweder sehr grosse Einsicht über die mütterlichen Gefühle siegt, oder wo solche mütterlichen Gefühle überhaupt nicht bestehen. Die Isolierung im Krankenhause ist aber auch durchaus nicht so einwandsfrei, wie man dies a priori annehmen könnte. Da, wo sie häufiger durchgeführt wird, macht man immer wieder die Erfahrung, dass die klinisch genesenen Kinder nach ihrer Rückkehr in die Familie häufig die gesunden Geschwister anstecken. Bei der Diphtherie lässt sich das vermeiden, wenn man nicht nach der klinischen Genesung, sondern danach sich richtet, wie lange die Genesenen noch Bazillen beherbergen und sie solange im Krankenhause zurückhält. Dast ist aber dann schwierig, wenn bei Massenepidemien der Zudrang der schwer Kranken zu gross wird und daher die klinisch Genesenen Platz machen müssen, ehe die bakteriologische Heilung abgewartet werden kann. Aber bei Scharlach kann man überhaupt nicht sagen, wann der Rekonvalescent seine Infektiosität verloren hat, und wenn man im allgemeinen den Zeitraum von 6 Wochen annimmt, so sieht man, dass viele Infektionen entstehen, wenn klinisch gesunde Kinder nach 6wöchentlicher Isolierung wieder in die Familie zurückkehren. Bei Masern bestehen keine solchen Bedenken, wenn hier die Isolierung im Krankenhause wohl allerdings selten sein wird, und beim Keuchhusten spielt die Hospitalisierung überhaupt keine Rolle.

Eine wirksame Isolierung kann nun aber leicht dann durchgeführt werden, wenn man nicht die kranken, sondern die gesunden Kinder entfernt. Meines Wissens besteht eine derartige Uebung in Deutschland in ausgedehnter Weise nur bei Scharlach. Im Jahre 1911 wurden in Bremerhaven, abgesehen von Erkrankungen, die aus der Nachbarschaft oder durch den Schiffsverkehr in Krankenhäuser kamen, 26 Scharlachfälle von Kindern oder jugendlichen Personen bei einer Bevölkerung von 23,000 Einwohnern beobachtet. Von diesen 26 Kranken wurden 12 in ein Krankenhause überführt, 12 wurden in der Familie behandelt, aber ausreichend isoliert, wenn Geschwister vorhanden waren. Die 26 Kranken hatten fast immer jüngere oder ältere Geschwister, nur in zwei Fällen waren Geschwister nicht vorhanden. In 9 Fällen wurde die Isolierung dadurch bewirkt, dass die Geschwister zu Verwandten oder anderen Personen in Pflege gegeben wurden, und zwar handelte es sich dabei um 11 Kinder, während die 26 Kranken im ganzen 44 Geschwister hatten. Die Massnahmen bewährten sich so gut, dass eine Weiterverbreitung durch die erkrankten Personen ausgeschlossen war. Der einzige Fall, in dem ein genesenes Kind seine bis dahin gesunden Geschwister infizierte, betraf merkwürdigerweise einen Knaben, der ins Krankenhaus überführt und dort 6 Wochen zurückgehalten war.

Von der Unterbringung gesunder Kinder in andern Familien wird aber, wie ich schon erwähnte, nur bei Scharlach Gebrauch gemacht, hier kommen auch die kranken Kinder häufiger ins Krankenhaus. Masern werden aber stets im Hause behandelt und die andern Kinder werden nicht isoliert, weil man die Krankheit für unvermeidlich und auch ungefährlich hält. Die Todesursachenstatistik belehrt uns aber eines Andern. Bei Keuchhusten liegen die Verhältnisse ähnlich. Es ist gerade bei diesen Krankheiten ein viel grösseres Gewicht auf die ausreichende Isolierung der kranken Kinder oder der gesunden Geschwister zu legen. Diese Isolierung wird gewöhnlich vernachlässigt, weil in den meisten Staaten Masern und Keuchhusten nicht anzeigepflichtig sind und darum die Mutmassung gleichsam behördlich bestätigt wird, dass hier die Ansteckungsgefahr unbedeutend und zu vernachlässigen sei, weil der Staat sich um diese Krankheiten nicht kümmert. Ueberall da, wo die Ueberführung ins Krankenhaus auf Schwierigkeiten stösst, sollte man die gesunden Kinder ausser dem Hause unterzubringen suchen. Das ist häufig nicht schwierig, in andern Fällen wird man allerdings die Mitwirkung von Behörden oder Wohltätigkeitsvereinen nachzusuchen haben. Auch dann wird man immer nur Erfolge haben, wenn die Familien nicht zu kinderreich sind. Die wirksame Isolierung der Kranken, die Verhinderung der Uebertragung von Krankheitskeimen auf die gesunden Familienmitglieder wird eine der dankbarsten Aufgaben der praktizierenden Aerzte sein und ist durch keine behördliche Massregel zu ersetzen.

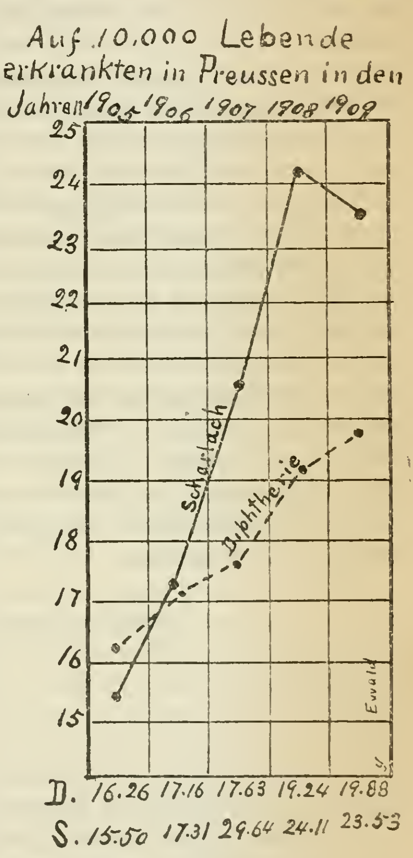
Am schlimmsten ist man aber beim Keuchhusten daran, der über Monate sich hinzieht und darum die Wachsamkeit einschläfert. Man hat vorgeschlagen, die keuchhustenkranken Kinder in besonderen Kindersanatorien an der See oder anderen günstigen Plätzen unterzubringen und man hat gelegentlich auch diesen Gedanken durchgeführt. Eine solche Anhäufung keuchhustenkranker Kinder bringt indessen grössere Gefahren, als dem therapeutischen Nutzen entspricht. Eher dürfte es angezeigt sein, die gesunden Kinder aus den Familien herauszurbringen, das dürfte sich jedoch erst bei einer weiter entwickelten Jugendfürsorge ermöglichen lassen, als wir sie heute im allgemeinen haben. Gerade beim Keuchhusten, der so viele Opfer fordert und die gefährlichste Kinderkrankheit überhaupt ist, sind unserm Handeln Schranken auferlegt. Man wird aber auch hier in sehr vielen Fällen vorbeugen können, wenn man sich der ganzen Gefahr der Situation bewusst ist und überhaupt vorbeugen will.

Es braucht wohl nur flüchtig darauf hingewiesen zu werden, dass die Einführung des Heilserums einen günstigen Einfluss auf die Sterblichkeit bei Diphtherie ausgeübt hat. Ein Mittel zur Bekämpfung der Krankheit selber ist es allerdings nicht geworden. Die prophylaktische Anwendung des Serums schützt nicht sicher vor der Inkfektion, und der hohe Preis hat die weitere Verwendung bisher gehindert.

Von denjenigen Umständen, die auf die Sterblichkeit an ansteckenden Kinderkranheiten einen Einfluss haben, ist schliesslich noch die Mangelhaftigkeit der ärztlichen Versorgung zu erwähnen. In vielen Fällen wird ein Arzt nicht hinzugezogen, oft bleibt die Krankheit überhaupt unerkannt. Dann ist der Verbreitung Tür und Tor geöffnet. So kam es im vorigen Jahre in Bremerhaven in der Vorschule des Gymnasiums zu einer Klassenepidemie von 5 Scharlachfällen, die ihren Ausgang von einem Schüler genommen hatte, der an einem leichten Scharlach erkrankt und ärztlich nicht behandelt war und schon nach wenigen Tagen von den Eltern wieder zur Schule geschickt wurde. Er infizierte seine nächsten Nachbarn in der Klasse, von denen einer leider der Krankheit zum Opfer fiel. Bei der Untersuchung durch den Schularzt stellte sich heraus, dass der Knabe noch im Abschuppungsstadium und somit höchst infektiös war. Nach seiner Eliminierung und der Desinfektion des Klassenzimmers hörten die Scharlacherkrankungen in der Klasse auf. Masern und Keuchhusten kommen nur selten in ärztliche Behandlung und haben gerade deshalb eine so ausserordentliche Verbreitung und verderbliche Wirkung.

Ich habe damit die vier Krankheiten charakterisiert, soweit sie ihre tödliche Wirkung entfalten und kurz auf ihre Bekämpfung hingewiesen. Die Art und Weise, wie man der Verbreitung der Krankheiten selber zu begegnen versucht, ist ganz anders. Man geht hier wie bei der Seuchenbekämpfung überhaupt vor. Die Seuchenbekämpfung ist in Deutschland im allgemeinen so organisiert, dass für gewisse ansteckende Krankheiten eine Anzeigepflicht besteht. Auf Grund der eingelaufenen Anzeigen stellt der beamtete Arzt darüber Ermittelungen an, wie die Krankheit entstanden, welches der Ansteckungsmodus gewesen ist, und macht dann seine Vorschläge zur Bekämpfung, die sich auf die Verstopfung der Ansteckungsquelle und die Verhinderung der Weiterverbreitung der Krankheit beziehen. Dieses Vorgehen hat sich vorzüglich bei Pest und Cholera und in beschränkterem Masse bei Typhus bewährt. Von den Kinderkrankheiten sind aber nur Scharlach und Diphtherie anzeigepflichtig. Auf die Bekämpfung von Masern und Keuchhusten verzichtet man von vornherein vollständig. Bei Scharlach und Diphtherie sind die Ermittelungen in die Hände der behandelnden Aerzte gelegt, der beamtete Arzt ist also ausgeschaltet. So segensreich es sein kann, wenn man den behandelnden Arzt zur Seuchenbekämpfung heranzieht, so aussichtslos ist es solange, als man die praktizierenden Aerzte bei ihrer Vorbildung nicht in der Seuchenbekämpfung unterrichtet. Das geschieht heute in mangelhafter Weise. Aber auch sonst ist die Bekämpfung des Scharlachs und der Diphtherie schwieriger als die anderer Infektionskrankheiten. Beim Scharlach kennt man den Erreger nicht einmal und bei beiden Krankheiten die Verbreitungswege entweder überhaupt nicht oder höchst mangelhaft. Dazu kommt, dass die Bebämpfung einer endemisch verbreiteten Krankheit immer viel schwieriger ist, als wenn es sich um eine einmalige akute Epidemie handelt.

Der Scharlach tritt in epidemischer Form recht selten auf, meist kommen überall vereinzelte Fälle vor und zu manchen Zeiten häufen sich solche Fälle. Aehnlich steht es mit der Diphtherie. Bei dieser beobachtet man aber häufiger epidemische Einfälle, die dann meist auf eine besondere Art der Verbreitung, z. B. durch Milch zurückzuführen sind. Bei solchen akuten Epidemien ist es meist nicht schwierig, den Verbreitungsweg zu finden und man hat hier mit den üblichen Mitteln der Seuchenbekämpfung vorzügliche Erfolge erzielt. Die Bekämpfung der endemischen Diphtherie erschöpft sich dagegen in der Eruierung von Bazillenträgern und Isolierung dieser teils gesunden, teils kranken Bazillenträger. Einen Einfluss hat dieses Vorgehen natürlich auf den Gang der Seuche nicht haben können. Seit dem Jahre 1905 ist in Preussen ein neues Seuchengesetz in Kraft, das den modernen Forderungen der Seuchenbekämpfung Rechnung trägt. Sie sehen nun auf diesem Diagramm die Scharlach- und Diphtherieerkrankungen seit 1905 dargestellt. (Abbildung III) Hierzu ist einschränkend zu sagen, dass es sich nur um die gemeldeten Fälle handelt und in wirklichkeit nicht alle Fälle auch gemeldet werden. Aber der Fehler, der hieraus entsteht, bleibt in den einzelnen Jahren derselbe, so dass man die Ergebnisse der einzelnen Jahre wohl miteinander vergleichen kann. Sie werden sich überzeugen, dass von einem Zurückgehen der Erkrankungen keine Rede sein kann. Die Diphtherie nimmt beständig zu und hat eine bedrohliche Höhe erreicht. Der Scharlach erreichte im Jahre 1908 sein Maximum, aber sein Abfall, der dann einsetzt, hängt nicht von der Wirkung des Seuchengesetzes ab, sondern entsteht aus der Periodizität, mit der die Kinderkrankheiten aufzutreten pflegen, und auf die ich hier nicht näher eingehen kann. Die heutige Art der Bekämpfung der ansteckenden Kinderkrankheiten ist also teils ein Schlag ins Wasser, teils, soweit Masern und Keuchhusten in Frage kommen, ein eingestandener Verzicht auf die Möglichkeit einer Einwirkung durch die Seuchengesetzgebung.



Abgesehen von dieser offiziellen Art der Bekämpfung der Kinderkrankheiten durch die Seuchengesetzgebung gibt es noch eine Bekämpfung, die sich indirekt aus der Tätigkeit der Schulärzte ergibt. So verschiedenartig die Schulorganisation an den einzelnen Plätzen auch sein mag, so wird doch immer eine gewisse Einwirkung auf die ansteckenden Kinderkrankheiten bestehen. Am vollkommensten lässt sich das da erreichen, wo jeden Tag ein Schularzt in die Schule kommt und in der Lage ist, die kranken oder verdächtigen Kinder sofort zu untersuchen. Die Bekämpfung der ansteckenden Kinderkrankheiten durch die Schulen hat nach zwei Richtungen eine Bedeutung. Einmal kann sie die Uebertragung einer Erkrankung von einem Schulkind auf das andere und indirekt damit das Hineintragen von Infektionsstoff in Familien verhindern, die bis dahin mit dem infektiösen Material nicht in Berührung gekommen waren. Es ist also hier die Aufgabe, zu verhüten, dass die Schule als Verbreitungsweg einer Seuche dient. Die weitergehende Aufgabe kann aber die sein, durch die erkrankten Schulkinder solche Familien zu eruieren, in denen andere Kinder vorhanden und daher also auch bedroht sind und eventuell Massnahmen zu veranlassen, die einer Weiterverbreitung durch diese Kinder begegnen. Die Frage, wieweit die Schule eine Bedeutung bei der Verbreitung der ansteckenden Krankheiten hat, ist recht umstritten. Theoretisch ist die Möglichkeit gegeben, dass ein krankes Kind sämtliche Klassengenossen und weiterhin auch andere Schulkinder anstecken kann, so dass die betreffende Seuche wirklich als Schulkrankheit anzusehen wäre. Die Infektiosität ist nun aber nur bei den Masern so stark, dass eine derartige Verbreitung wirklich ernstlich zu fürchten wäre; bei den andern Krankheiten wird es immer nur zu Einzelinfektionen kommen, die sich dann allerdings kettenartig fortsetzen können. Für die Verbreitung der Masern durch die Schule möchte ich auf folgende kleine Tabelle hinweisen, die eine Uebersicht über eine Masernepidemie und das Zustandekommen der Infektion gibt. Im Winter 1860–61 beobachtete man in Frankfurt a. M. eine Epidemie von 733 Fällen. Die Verbreitung war folgende:

	November.	Dezember.	Januar.	Februar.	März.	April.	Mai.
Uberhaupt erkrankt	79	131	100	77	133	96	55
In den Schulen	49	79	46	31	56	34	9
Prozent	62	52	46	40	42	35	16

Es zeigt sich also, dass die Verbreitung der Epidemie durch die Schulen im Anfang der Epidemie sehr bedeutend war. Die Maserninfektion wurde zuerst durch die Schulen verbreitet und von da in die Familien gebracht, in zweiter Etappe folgte dann die Uebertragung selber in den Familien auf die noch nicht durchmaserten Geschwister. Im Verlaufe der Epidemie wurde die Zahl der Ansteckungen durch die Schulen immer geringer und sank allmählich von 62 Prozent völlig regelmässig mit einmaliger Unterbrechung bis auf 16 Prozent herab. Auch heute werden mancherorts solche Massenepidemien beobachtet, denen nur durch Schluss der betreffenden Klasse oder gar der Schule auf 14 Tage begegnet werden kann. Im allgemeinen aber werden auch bei den Masern heute eigentliche Klassenepidemien zu den Ausnahmen gehören. In Frankfurt a. M., z. B., würde bei der heutigen Grösse und Enwicklung der Stadt eine derartige Schulepidemie nicht mehr möglich sein. Das hängt damit zusammen, dass die ansteckenden Kinderkrankheiten ihr periodisches Aufreten geändert haben. Früher traten die Masern in regelmässigen Abständen von 2–3 Jahren auf, um inzwischen völlig zu erlöschen. Wenn ein Fall in eine Stadt eingeschleppt wurde, verbreitete sich die Krankheit schnell weiter, bis alle Kinder, die noch nicht durchmasert waren, die Masern überstanden hatten. Dann hörte gewissermassen das Material auf und die Seuche kam zum Erlöschen. Das hat sich nun durch die Zunahme des Verkehrs geändert, so dass dieser Typus nur in entlegenen Gegenden oder auf dem Lande noch vorkommen kann. Heute sterben die Masern in jeder grösseren Stadt nicht aus, sondern schleppen sich dauernd fort. Die meisten Kinder haben daher bei ihrem Eintritt in die Schule Masern schon gehabt.

In Bremerhaven wird im ersten Schuljahre festgestellt, welche Kinder früher schon Masern gehabt haben. Dabei hat sich ergeben, dass 91.55 Prozent der Kinder vor dem ersten Schuljahre bereits Masern gehabt haben. Da die durchmaserten Kinder vor erneuter Infektion geschützt sind, bedürfen sie auch im Falle einer Epidemie keiner Aufsicht. Die wenigen anderen Kinder sind natürlich leicht zu beobachten. Auch wenn sie sämtlich auf einmal erkranken, erübrigt sich ein Schul- oder Klassenschluss, da selbst in den untersten Klassen meist nur 1–3 Kinder noch nicht durchmasert sind. Es wird überall in den Schulen notwendig sein, festzustellen, wie viele Kinder schon früher Masern gehabt haben. Insofern muss übrigens auch heute der Schule ein Einfluss auf die Verbreitung der Masern zugestanden werden, als zu Beginn des Schuljahres immer eine ganze Anzahl von neueingeschulten Kindern, die noch nicht durchmasert waren, erkranken. Die Fernhaltung von Kindern, die an Keuchhusten erkrankt sind, aus der Schule erledigt sich gewöhnlich dadurch von selbst, dass die Lehrpersonen hier wegen der alarmierenden Symptome schon rechtzeitig selbst einzugreifen pflegen. Bei Scharlach und Diphtherie erübrigt sich in Bremerhaven ein besonderes Eingreifen des Schularztes, da nach dem bremischen Seuchengesetz die Bekämpfung in etwas anderer, mehr dem Zweck entsprechender Form als in Preussen erfolgt. In allen Fällen wird der Schularzt sowohl durch die Schule als auch durch die Behörde von jedem Fall von Scharlach und Diphtherie, bei Masern, Keuchhusten und andern Infektionskrankheiten ausschliesslich durch die Schule benachrichtigt und kann somit den Stand der Epidemie hinsichtlich der Verteilung auf die Klassen und Schulen jederzeit verfolgen und eventuell rechtzeitig eingreifen. Bei Scharlach und Diphtherie werden in jedem Falle umfangreiche Ermittelungen angestellt und für Isolierung Sorge getragen, wobei ich auf die früher für Scharlach genannten Zahlen hinweise. Ueber die Geschwister der Erkrankten wird ein Schulverbot ausgesprochen, dessen Dauer der beamtete Arzt vorschlägt. Bei Diphtherie wird das Schulverbot erst aufgehoben, wenn durch bakteriologische Untersuchung festgestellt ist, dass weder der Genesene noch die gesund gebliebenen Geschwister Bazillenträger sind. Diese Massnahmen erweisen sich für die Bekämpfung der ansteckenden Kinderkrankheiten in den Schulen als ausreichend.

Noch wichtiger als die Ueberwachung der Schulen ist diejenige von Krippen, Kinderhorten, Waisenhäusern und ähnlichen Anstalten, in denen jüngere Kinder des Tags über untergebracht werden, während die Eltern der Arbeit nachgehen. Nier ist die Gefahr einer Ansteckung deshalb so viel grösser, als es sich einmal um Kinder in niedern Altersklassen handelt, die eine grössere Empfänglichkeit für die ansteckenden Krankheiten und auch eine grössere Mortalität haben als die älteren Kinder, sodann aber deswegen, weil kleinere Kinder beim Spielen viel inniger miteinander in Berührung kommen und darum Infektionsstoffe leichter unter sich austauschen. Es ist daher unbedingt notwendig, dass auch solche Anstalten unter ständiger ärztlicher Ueberwachung stehen, und dass die Zulassung zum Besuch derselben unter denselben Kautelen erfolgt wie bei den Schulen.

Ich habe schon erwähnt, dass die Schulen und Kleinkinderanstalten über den jetzigen Rahmen hinaus der Ausgangspunkt für eine wirksame Bekämpfung der Kinderkrankheiten werden könnten, wenn man von den Erkrankungsfällen ausgehen und eine aktive Füsorge in den betroffenen Familien ausüben würde. Denn dass ein Schulkind von 6–8 Jahren an Masern oder Keuchhusten erkrankt, ist quoad vitam harmlos und auch bei Scharlach und Diphtherie nicht allzu gefährlich. Die Gefahr besteht hauptsächlich darin, dass nun die jüngeren Geschwister infiziert werden. Sie sind erheblich gefährdet und zwar, wie ich schon ausführte, um so mehr, je jünger sie sind. Von vornherein müsste hier ein aktives Vorgehen stattfinden, derart, dass besondere Hilfsbeamte des Schularztes oder des beamteten Arztes in der Familie die Zustände feststellen und darüber Bericht erstatten. Alsdann könnte man darauf hinwirken, dass entweder in der Familie eine ausreichende Isolierung stattfindet oder der Kranke in ein Krankenhaus kommt oder die gesunden Geschwister aus der Familie entfernt werden. In allen Fällen könnte man auf die Beschaffung ärztlicher Hilfe hinwirken und könnte der Behörde eventuell Vorschläge für eine weitergehendes Vorgehen machen. Am zweckmässigsten würde man diese neue Art der Fürsorge an die jetzt schon vielfach geplanten und zum Teil in Wirklichkeit umgesetzten kommunalen Wohlfahrtsämter oder Jugendfürsorgeämter angliedern. Durch eine solche aktive Fürsorge würde erreicht werden, dass in erster Linie dis Kranken selber zu ihrem Recht kämen. Gegenüber der grossen Verständnislosigkeit, die in den weitesten Kreisen über Krankheiten und Krankheitsbehandlung herrscht, ist es unbedingt nötig, dass die kleinen Kranken nicht solchem Unverstande zum Opfer fallen und wenigstens vernünftig gelagert und ernährt werden. Auch die Herbeiführung ärztlicher Behandlung wird sich in den meisten Fällen ermöglichen lassen.

In Deutschland ist die minderbemittelte Bevölkerung ausnahmslos in Krankenkassen versichert oder kommt jetzt in die Krankenversicherung durch die Reichsversicherungsordnung. Eine grosse Zahl von Krankenkassen haben Angehörigenunterstützung, d. h. Frau und Kinder des Versicherten erhalten im Erkrankungsfalle freie ärztliche Behandlung und Arznei. Von den neu eingeschulten Kindern der Volksschulen Bremerhavens z. B. erhalten 43.95 Prozent im Erkrankungsfalle derartige Unterstützung durch Krankenkassen; bei den andern handelt es sich entweder um Kinder bemittelter Eltern oder um Kinder, die ohne weiteres von der Armenfürsorge übernommen werden können. Die ärztliche Behandlung gewährt die Darreichung der zweckmässigen Arznei und sichert auch weitgehende Serumbehandlung bei Diphtherie. Ein derartiges Fürsorgeamt würde im Bedarfsfalle auch sonst für die Beschaffung von Heilserum sorgen können. Neben solcher Fürsorge für die Kranken könnte man vor allem aber die bis dahin gesund gebliebenen Kinder schützen und so etwas Wirksames zur Bekämpfung der ansteckenden Kinderkrankheiten tun. Der Fürsorgeabteilung würde es übrigens nicht schwer fallen, mit Hilfe von Standesämtern, Aerzten, Hebammen, Krankenkassen u. s. w. auch die andern Fälle von ansteckenden Krankheiten zu eruieren, die durch die Schulen noch nicht bekannt werden. Sie könnte auch im einzelnen die Verbreitungswege der Krankheiten kennen lehren und damit eine Grundlage für besondere Massnahmen schaffen.

Ich habe eingangs darauf hingewiesen, dass die ansteckenden Kinderkrankheiten in solcher Massenhaftigkeit auftreten, dass sie jedem Staate schwere Verluste an Menschenleben und damit an Nationalvermögen zufügen. Diese Verluste sind grösser als bei allen andern Infektionskrankheiten. Die bisherige Art der Bekämpfung hat vollständig versagt und muss darum auch durch anderweitige Einrichtungen ersetzt oder ergänzt werden. Hierbei werden sich je nach den örtlichen Verhältnissen verschiedene Massnahmen empfehlen, in allen Fällen wird es aber zweckmässig sein, eine neue Art besonderer Fürsorge ins Leben zu rufen, die zunächst von den Erkrankungen in den Schulen ausgehen könnte, um die einzelnen Krankheitsfälle festzustellen und dafür zu sorgen, dass sowohl die

tödlichen Wirkungen der Kinderseuchen als auch ihre Weiterverbreitung selber bekämpft wird. Im allgemeinen wird sich diese neue Fürsorge leicht in bestehende Einrichtungen eingliedern lassen und einen Nutzen erzielen, der in keinem Verhältnis zu den aufzuwendenden Kosten stehen muss.

THE SCHOOL CHILDREN OF THE STOCKYARDS DISTRICT.

[An investigation carried on under the direction of the Board of the University of Chicago Settlement.]

Caroline Hedger, M. D., Chicago, Ill.

School children of the stockyards district.

'Tis a gray neighborhood—the Chicago Stockyards; smoke and dumps, and grimy houses; and, when formerly the children picked on the dumps, one had to watch closely for motion there, the general correspondence in the tone of the children. their clothing, and the surroundings, making them almost invisible. Sometimes, with the smoke, comes down the smell of the fertilizer plants, and this is not conducive to deep breathing or to sound sleep; and the children impress one as lacking oxygen—round-shouldered, thin, and rather pale.

This general impression made me go into the study of their physical condition with the idea that the cause of their retardation could easily be found in this field. Such is not the case. While the physical findings in the tables are alarming, when viewing the group as a whole, they are distributed in such a way as to make one suspect other causes to be in more direct connection with the school retardation. With their working efficiency later, undoubtedly, their physical condition will have much to do. Rather, this poor condition of the whole group serves as the underlying factor on which the other causes of retardation act with more or less violence. The future of the child is made up from this physical condition plus the education we give him. We must spend some time on these defects to realize the kind of citizens we are building, to get the picture of these physical conditions fixed to use as the background of other phases of the child's life.

Forty-eight per cent is the average amount of retardation, on Ayres's standard, in the two schools in this district from which the 800 pupils were studied. The investigation in the homes was done by Miss Montgomery, long in the neighborhood and in the schools, better fitted than anyone else to discover the truth. The school facts were supplied by Mrs. McArthur. All of us worked under the Board of the University of Chicago Settlement, by whose permission I am able to give the data.

By grades, the children were distributed as follows:

TABLE I.—*Children by grades.*

	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Total.
Retarded	19	50	89	91	52	62	21	16	400
Normal	16	63	82	88	53	36	38	34	400

By ages, their distribution is according to Table II:

TABLE II.—*Children by ages.*

	6 years.	7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years.	16 years.	Boys.	Girls.	Total.
Retarded	....	2	13	51	57	56	51	70	73	26	1	247	153	400
Normal	3	42	76	80	64	42	43	33	17	....	....	213	187	400

Thus, of the 400 retarded children studied, 89 per cent of them were aged 9 to 14 years, and the great majority of the group came in grades 2 to 6; while of the 400 normal children, also mainly in grades 2 to 6, 86 per cent were of the ages 7 to 12.

The children were largely American born, 683 of them having been born here. The other 117 were distributed among 12 nationalities, 30 being Polish, 28 Austrian, 22 Bohemian, and the rest, in lesser number, Slovak, German, Russian, Irish, Scandinavian, Hungarian, English, Italian. and Canadian. The parentage was mainly foreign, 41 children only having both parents American, and these were for the most part second-generation immigrants. The nationality of the parents was found to be almost wholly Slavic. (See Table III.)

TABLE III.—*Nationality of parents.*

	Both American.	Both parents foreign.								One parent foreign.							
		Bohemian.	German.	Irish.	Lithuanian.	Polish.	Slavic.	Other.	Total.	Bohemian.	German.	Irish.	Lithuanian.	Polish.	Slavic.	Other.	Total.
Retarded	16	84	31	50	32	105	17	12	331	4	15	12	1	2	....	5	39
Normal	25	90	44	32	20	77	19	15	297	22	17	5	....	4	1	17	66
Per cent retarded	39	48	41	61	61	55	47	....	......	....	....	....	....	....	....	37	....

In proportion, more children of foreign-born parents were retarded, while the best group proportionately was that of the children with one American parent.

The general impression of poor nourishment, together with a knowledge of the feeding methods of the neighborhood, caused us to give especial attention to weights and heights:

TABLE IV.—*Heights, weights, and chest measurements—Boys.*

Age.	Number.		Mean height (in inches).		Mean weight (in pounds).		Mean chest (in inches).	
	Normal.	Retarded.	Normal.	Retarded.	Normal.	Retarded.	Normal.	Retarded.
7 years	38	1	47.5	45.5	52	45.5	23	22.5
8 years	51	10	49.5	48.5	56	55	23.5	24.5
9 years	50	32	52	51	60.5	59	24.5	24.5
10 years	32	37	54	52.5	69	63	25.5	25
11 years	24	30	55	54	70	68.25	25.75	25
12 years	22	35	57	56	79	75.5	26.25	26
13 years	14	41	59.25	57	87	81	26.75	27
14 years	11	48	62.5	59	102	85.5	28.5	28
15 years	....	12	....	61	....	95	....	29
16 years	....	1	....	65	....	108	....	28

TABLE V.—*Heights, weights, and chest measurements—Girls.*

Age.	Number.		Mean height (in inches).		Mean weight (in pounds).		Mean chest (in inches).	
	Normal.	Retarded.	Normal.	Retarded.	Normal.	Retarded.	Normal.	Retarded.
6 years	3	....	47	....	47	....	22.5	....
7 years	17	1	46.5	45	50	59	22.5	21.5
8 years	49	3	50	51	55.5	55	23.5	23.5
9 years	45	19	51	50	58	62	23.5	23.5
10 years	45	20	54	53.25	69	70	25	24
11 years	18	26	55.75	56	70	75	25.5	25
12 years	20	16	58	57	75.5	88	26.25	26
13 years	20	29	61	59	93.5	90.5	27.5	28
14 years	6	25	64	60	110.5	98	30.5	27.75
15 years	....	14	....	62.5	....	98	....	28.5

In these tables you will see that the normal boys are noticeably taller and heavier than the retarded, while among the girls of 9, 10, 11, and 12 years the retarded were heavier than the normal.

The children were classed as "well nourished" when they had some color, some muscular tone, showed some alertness, and weighed at least a pound per inch of height. This decision has in it an element of personal equation, for when a child impressed me as being a scrap, it was put in the "poorly nourished" class. One boy fainted from hunger while being examined. An intermediate class of "fairly nourished" accommodated those who had only one or two requirements for the "well-nourished" group. A count of the record of nourishment gave:

TABLE VI.—*Nutrition in relation to retardation.*

	Good and fair.		Poor.
	Number.	Per cent.	Number.
Retarded	261	70	107
Normal	293	74	103

The first thing we found was that the whole group was saturated with tea and coffee, only 42 children being free from these stimulants.

TABLE VII.—*Tea and coffee—Nutrition.*

Good nutrition—263 took tea or coffee one to three times a day.
Fair nutrition—307 took tea or coffee one to three times a day.
Poor nutrition—230 took tea or coffee one to three times a day.

TABLE VIII.—*Tea and coffee: Retarded and normal.*

	Times.				
	0	1	2	3	More.
All retarded	17	27	109	176	71
All normal	26	57	119	150	48

Table VIII shows that the normal children have the best showing in the low amount of coffee taken.

TABLE IX.—*Nutrition in relation to nationality of parents.*

	Both American.	Both parents foreign.							One parent foreign.						
		Bohemian.	German.	Irish.	Lithuanian.	Polish.	Slovac.	Other.	Bohemian.	German.	Irish.	Lithuanian.	Polish.	Slovac.	Other.
Good and fair	43	130	52	59	40	135	24	22	21	21	10	1	3	....	6
Poor	28	44	23	23	13	37	12	5	5	11	7	....	3	....	4
Per cent poor	39	25	30	28	24	21	33	18	19	34	41	....	50	....	40

Table IX gives a distinctly unfavorable impression of the effect of mixed marriages on nutrition with any group except the Bohemian. And the high percentage of Americans poorly nourished simply means that Americans cannot do well in the neighborhood dominated by immigrant wage, and it is the Americans lacking the initiative to get away that stay.

TABLE X.—*Percentage of poorly nourished and of retarded, by nationality.*

	American.	Bohemian.	German.	Irish.	Lithuanian.	Polish.	Slovac.	Other.
Poorly nourished	39	25	30	28	24	21	33	18
Retarded	39	48	41	61	61	55	47	....

This table does not mean, in its lack of correspondence, that the nourishment should not be improved. It means that these are peasant children, or the children of peasants, and have not yet lost all the vigor of the soil. It was a matter of comment amongst the workers that we could roughly guess the length of time that the child had been in this country. The absolute relationship between the poor nourishment and the retardation, in the American group, may be a prediction of what will occur when, in another generation, the balance between the child and his environment is really reached.

In the observation of the teeth, always so closely related to nutrition, deformities and abnormalities were not recorded. The figures concern carious teeth:

TABLE XI.—*Carious teeth: Retarded and normal.*

	Number rotten.							Filled.
	None.	1	2	3	4	5	6 or more.	
Normal	52	61	81	68	51	29	59	7
Retarded	91	65	87	60	25	31	31	10

The large number of children under 10 years will in part explain this table, but the whole fact is that only 160 children had teeth free from caries or filled (17 children having teeth that were filled), thus we found 640 children with rotten teeth in their mouths.

TABLE XII.—*Relationship of skin diseases to American birth.*

	American.	Foreign.
Retarded	90	30
Normal	92	10
Total	[a] 182	[b] 40

[a] 27 per cent. [b] 35 per cent.

TABLE XIII.—*Relation of skin disease to American parentage.*

Two parents American	16, or 39 per cent.
One parent American	34, or 32 per cent.
No parent American	168, or 25 per cent.

The most prevalent skin disease was pediculosis, but 14 skin diseases appear in the record, and should be noted because of their relation to truancy, and thus, secondarily, to retardation. Unless the medical department closely cooperates with the compulsory education department they can not do a great deal toward neutralizing each other's work; for instance, if the truant officer rounds up three children, and the nurse or the doctor sends home two of them for contagious skin disease, there is a considerable loss in the work of high-priced employees.

TABLE XIV.—*Enlarged glands, hypertrophied tonsils, adenoids, and anemia.*

	Enlarged glands.	Hypertrophied tonsils.	Adenoids.	Anemia.
400 retarded	349	121	38	170
400 normal	334	156	48	160

These findings are not so evenly balanced as they appear, because we have a larger number of normal children under the age of 11 years, at which age these defects are more common.

TABLE XV.—*Retarded and normal above and below 11 years of age.*

	Up to 11 years.	11 to 15 years, inclusive.	Per cent. above 11 years.
Retarded children	123	277	69.2
Normal children	265	135	33.7

The proportion, if carried out, gives the normals a slight advantage in glands, but only a slight one—22 cases above and below 11 years. Likewise in hypertrophied tonsils the normals have a slight advantage above 11 years of age.

One unexplained superiority of these children is the small number of cases of adenoids. There were only 38 retarded and 48 normal, divided as follows: Retarded, below 11 years of age, 19; 11 to 16, inclusive, 19; normal, below 11 years of age, 28; 11 to 16, inclusive, 20.

TABLE XVI.—*Total number of physical defects of all children.*

	Number of children.	Total defects.	Defects by ages.							
			14 years.	13 years.	12 years.	11 years.	10 years.	9 years.	8 years.	7 years.
Retarded	394	2,555	395	445	321	370	407	368	77	......
Normal	319	1,967	76	89	218	208	332	412	375	191
Normal in families having retarded	80	549	8	20	39	44	90	113	137	114
Total normal	399	2,516	84	109	257	252	422	525	512	305

Average number of defects per child, by ages.

	14	13	12	11	10	9	8
Retarded girls	5.87	6.75	6.63	6.96	7.65	7.47	....
Normal girls	5.66	5.17	6.53	6.93	6.77	5.98	7.00
Retarded boys	5.54	5.93	6.32	6.53	7.06	7.06	....
Normal boys	4.20	4.46	5.63	5.38	5.54	7.09	6.20

This table gives the same picture as that given by Ayres, namely, decreasing number of defects with advancing age, thus giving the retarded children an apparent advantage, as there are more retarded children recorded at the higher ages. It is undoubtedly true that the normals have fewer defects at every age than the retarded; but at no age is the average difference greater than two defects, and, as we shall see later, the handling of these defects counts more than their actual occurrence. This statement is borne out by a control study of 72 normal children in one of Chicago's best residence neighborhoods, where the children were able to make their grades without difficulty, though their average number of defects was almost that of these children.

The figures on anemia were based on the color of the nails and of the inside of the eyelid, but are confirmed by years of practice, in the neighborhood, with many blood counts. Fifty-five to 65 per cent of hemoglobin is the usual finding amongst the children, and may have relation to the smoke—which has a tendency to inhibit normal respiration—to the lack of ventilation in the houses, or to the dry and bad air supplied in the schools. In a former study the average humidity in 15 schoolrooms in one of these schools, taken between 10 and 11 o'clock in the morning, was found to be 41 per cent, exceeding the aridity of Arizona and equaling the drier parts of the Sahara Desert.

The lack of ventilation in the homes is due to the fact that the people live in fear, as well as ignorance and insufficient heat; and they have a basis for this fear in the exploitation that they have to undergo in this country. But the result on the child of the air in his home and in school is disastrous.

Thirty-three per cent of the children showed some enlargement of the thyroid gland, the retarded showing more, while the proportion of boys was larger in small goiters, with 100 boys to 101 girls in the large goiters.

The situation with respect to heart lesions is distinctly bad.

TABLE XVII.—*Heart lesions.*

	Pulse.		Murmurs.	
	Rapid.	Irregular.	Nontransmitted.	Transmitted.
Retarded	35	45	28	70
Normal	49	59	36	74

One acute pericarditis with effusion was found, to which no attention had been given. A call on the doctor in that neighborhood is not a social relaxation, but a stern necessity. Dr. Abt, a man of large experience with this class of children, considers that a real degeneration of the heart muscle occurs in the irregular pulse group, due to malnutrition. Can not the tea, coffee, and alcohol be also factors?

Table XVIII.—*Orthopedic defects.*

	Lateral, slight.	Curvature, marked.	Scoliosis.	Pigeon breast.	Other rickets.	Winged scapulae.
Retarded	46	132	16	15	19	32
Normal	28	145	4	23	55	49

This group of children is not to be benefited by marching up and down a dusty hall to the bang of a piano. If that cherished idea of marching in the school is to be perpetuated, let us be efficient and utilize the power—let us have a treadmill. The curvature was marked in the lower grades, due in part, probably, to the Slavic habit of wrapping the child in the mother's shawl and carrying it always on the same arm.

Ten and eight-tenths per cent gave gross evidence of defective hearing, the retarded children having about 2 per cent the worst of it. Thirty-five children had discharging ears.

The eye findings are of actual inability to see, and are startling enough when viewed from that side, but until we know the nervous strain involved in even the eyesight recorded as normal, we shall be considering an unsolved problem. We can guess at a little of this by the headache; 264 children complained of some headache, while 148 had it frequently and severely.

Table XIX.—*Headache.*

	Some headache.	Much headache.
Retarded	96	59
Normal	151	89

Some of the headache undoubtedly is referable to anemia and nasal-abnormalities.

Table XX.—*Eye defects (Snellen test chart).*

	Both eyes (20).	One or both (5-10 off).	One or both (15-25 off).	One or both (30 off).
Retarded	67	151	30	58
Normal	76	195	27	51

This table of eye findings corresponds, though with small margins, with the retardation. I have found this to be true in other studies. And if glasses could be afforded, it would be one practical way of improving not only the nervous balance but the school standing of the child.

The death rate from tuberculosis in this ward is 10 per 10,000 above the average for the whole city, and there are a large number of positive lung findings. "Positive lung findings" in this study means three or more signs of consolidation, while "suspicious lung findings" means one or at most two signs of consolidation, such as prolonged expiration plus increased voice tones. One little girl with pulmonary hemorrhages was in school, and some active, progressive cases were seen in children that looked well nourished. An open-air room with extra nourishment was maintained in one of the schools. It should have accommodated three times the usual number of 25. To make it a necessity to expose a child to, or to inoculate him with, tuberculosis before giving him the air to breathe and the food that he needs puts me in the class of Jane Addams's foreign neighbor, who could not understand why his boy had to steal before he could have a chance to be sent to the farm school.

TABLE XXI.—*Respiratory tract.*

	Nasal obstructions.	Hypertrophied tonsils.	Adenoids.	Lungs.		
				Negative.	Suspicious.	Positive.
Retarded	130	121	38	251	56	93
Normal	146	187	48	257	60	88

Let us now consider the facts available in the school history of these children, their age of starting, kindergarten, transfers, and repeated grades.

TABLE XXII.—*Age of starting.*

Age.	Normal.	Retarded.	Age.	Normal.	Retarded.
4 years	3	....	8 years	3	10
4½ years	16	17	8½ years	2	36
5 years	10	4	9 years	....	7
5½ years	49	39	10 years	....	14
6 years	65	19	11 years	....	2
6½ years	114	132	12 years	....	7
7 years	28	24	14 years	....	1
7½ years	18	55	15 years	....	1

Part of the retardation with which we are dealing is due to late starting, as shown by the accompanying table (XXII), only five of the normals beginning after 8 years, while 78 retarded children did so. These retarded children are not deficient, any more than their fellows; they simply did not get into step at the beginning, and have suffered ever since. The overloading of the school in the lower grades, and the inability of so many of the children to graduate from the eighth, give exactly the same results as if they were deficient children. Added to this, the child's lack of good standing must be a bad psychological fact, making him content to scramble along, somehow, in his inferior position.

The repeating of grades shows that both retarded and normal halt at the first grade, then in decreasing, though ever large numbers, they repeat to the sixth, when there is an increase in all the retarded children and in the normal boys. Why is this?

TABLE XXIII.—*Repeated grades.*

	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.
Retarded	182	105	80	41	17	31	6	1
Normal	137	28	22	8	1	3	1	1

The pitiful side of this is the table of wasted years (XXIV):

TABLE XXIV.—*Wasted years—Gained years.*

	Retarded girls.	Normal girls.	Retarded boys.	Normal boys.
Years wasted	122.5	78.5	279	76
Years gained	10.5	23	10	24.5
Total years wasted	112	55.5	269	52.5

Over four centuries of effort taken out of the children's lives, and, incidentally, paid for out of the taxes, with no visible result. Or, taken in this way, 12 years' work for one teacher, with a whole grade of 40 children.

Eighty-three retarded children had some kindergarten work, in comparison with 154 normals. Too much stress must not be placed on this influence, though it appears distinctly favorable to the kindergarten. The mother enlightened enough to send the child to kindergarten might have made an environment at home more favorable to normal progress; but, at any rate, the combination worked well in this group.

In a neighborhood with different economic conditions than this, it is well within the scope of the imagination that retardation might be of distinct advantage to certain individuals in the group, because some develop more slowly. But there is no chance for individuation here; the child is like the mail train taking the village mail bag while passing at full speed, he gets his education as he goes through, or he gets it not at all, because the economic situation sends him out to work. This point will be developed in the next section of the study.

Just here we will consider his chance of finishing. This table is based on parental ideals and economic necessity.

TABLE XXV.—*Can the child finish the eighth grade?*

	Yes.	No.	Doubtful.
Retarded	55	216	123
Normal	188	87	216

Another matter to which considerable attention was given was that of transfers. The 400 retarded children had "done time" in 159 parochial schools and in 257 public schools other than the ones in which they were studied; or, each pupil averaged more than two schools. Not only was the retardation caused by differing standards in the schools, but by days and weeks where it was possible to be out of school during the process of transfer. This is due to a poorly worked-out system for keeping track of the child. The normal children had been in 36 parochial schools and 176 public schools, only about every other child having shifted. There are cases, many of them, in which the child leaves school the day he is 14 years of age, whether he has to go to work or not. This, of course, can be attributed to the lack of correlation between the school and the child, either as to his liking and interest, or to his fancied future financial advantage, but the fact is that the larger number will leave school because they must. (See Table XXV.)

Let us now consider the homes, and here we shall find our testimony not quite so evenly balanced. Have they homes? They try to have them.

TABLE XXVI.—*Rents.*

Families.	Rent payers.			Average rent.	
	Girls.	Boys.	Total.	Girls.	Boys.
Retarded	96	141	237	$9.26, including 5 stores.	$9.87, including 2 stores.
Retarded and normal [a]	18	28	36	$10.01, including 1 store.	$20.80, including 2 stores.
Normal	71	94	165	$13.96, including 5 stores.	$13.05, including 11 stores.

[a] "Retarded and normal" means families having children in both groups. The rent will be taken up again to see what it procures for the child.

TABLE XXVII.—*Mortgages.*

	Number.			Amount.		
	Girls.	Boys.	Both.	Girls.	Boys.	Total.
Retarded	30	47	77	$45,550	$94,450	$140,000
Retarded and normal	5	8	13			
Normal	21	48	69	21,650	34,750	56,400

Leaving out of consideration those families having in the list both retarded and normal children—and these should really be counted with the retarded—the normal group should be carrying, for the size of the group, $96,000 in mortgages, to equal the retarded group, instead of the $56,000 they were found to be carrying. Have mortgages anything to do with retardation? Yes; in many ways. First, the burden affects nutrition. One woman said "that $31 a month has to be paid, if we starve." A family in my knowledge, while paying the mortgage, beat the children when their shoes wore out, and the mother, wrongly supposed to be tubercular, quickly gained 25 pounds when circumstances suddenly placed her where she had enough to eat.

The instinct present in all of us to have a home may, when augmented by the fear of nonsupport in old age, become a menace to the child. If we really believe that the home is the best place for a child, the workingman should receive what he produces, in order that the home could be provided without starving the child or sacrificing his education. Getting what he produces, if he works, he might have a home; then, if he does not work, neither shall he eat.

TABLE XXVIII.—*Homes owned free of mortgage.*

Retarded	53
Retarded and normal	21
Normal	109

TABLE XXIX.—*Taxes.*

	Boys and girls.	Tax-payers.	Taxes recorded.	Yearly average tax.	
				Boys.	Girls.
Normal	400	157	104	$27	$34
Retarded	400	133	114	41	34

TABLE XXX.—*Water taxes.*

	Girls.			Boys.		
	Total amount.	Number.	Yearly average.	Total amount.	Number.	Yearly average.
Retarded	$300	30	$10	$911	70	$13
Normal	492	49	10	300	30	10

These tables show that in the group of retarded boys both the property tax and the water tax are considerably higher than in the other groups. This is quite in accord with the Biblical basis of taxation observed elsewhere than in the stockyards district, "To him that hath shall be given, and from him that hath not shall be taken even that he hath."

Our next consideration is to see what the renter gets for his rent, and the relation of that to the child. The great majority get four rooms, whatever the size of the family.

Average number of living children in the whole group, 4.3 to the family.

Average number of dead children in the whole group, 1.4 to the family.

Families of retarded: Average living children, 4.3; dead children, 1.8.

Families of retarded and normal: Average living children, 5; dead children, 1.5.

Families of normal: Average living children, 2.4; dead children, 1.1.

Total living and dead children by nationality of father.

	American.		Bohemian.		German.		Irish.		Lithuanian.		Pole.		Slovak.		Other.	
	Living.	Dead.	Living.	Dead.	Living.	Dead.	Living.	Dead.	Living.	Dead.	Living.	Dead.	Living.	Dead.	Living.	Dead.
Retarded	117	46	198	53	139	58	167	84	97	38	351	165	35	12	70	26
Retarded-normal	73	21	140	43	48	15	31	11	14	4	40	9	14	2	12	6
Normal	123	32	196	42	130	43	94	44	48	10	245	66	45	11	104	23

TABLE XXXI.—*Number of rooms in dwelling.*

	1 room.	2 rooms.	3 rooms.	4 rooms.	5 rooms.	6 rooms.	7 rooms.	8 rooms.	9 rooms.	10 rooms.
Retarded	2	8	26	220	56	56	15	6	2	2
Normal	......	......	17	166	43	42	16	16	6	8

No up-to-grade child came out of a one or two room tenement. How could he have? One, two, and three room flats in this table produce twice as many retarded as normal children, while eight, nine, and ten room flats house three times as many normal as retarded children. The dark rooms recorded were: Retarded, 177; normal, 152. The use of gas by the family: Retarded, 87; normal, 106. Toilet in the house: Retarded, 99; normal, 95. Bathtubs: Retarded, 50; normal, 57—a total of 107 bathtubs for the group of 800 children, and for the whole group of children and adults concerned of nearly 5,000 people. Among these houses there was only one steam heated, and there were one or two wired for electricity.

TABLE XXXII.—*Families of two or more people to a room.*

	Girls.	Boys.
Retarded	47	70
Normal	26	22

Taking into consideration the number in each group, the retarded boys have more than three times, proportionately, while the retarded girls have not quite twice, the crowding of the normals.

Why do these families with retarded children pay less rent, carry more mortgages, live in fewer rooms, use less gas, have fewer bathtubs, and declare they will take the children out of school before completing the eighth grade? Because of their incomes, in the main. Of course, shiftnessness, alcohol, sickness and death play their share there as elsewhere, and the neighborhood is cursed with saloons, there being 192 in these two school districts. But the alcohol question has not been gone into in sufficient detail in this study, and just what part it plays we can not say. In regard to death we have:

TABLE XXXIII.—*Children deprived of their parents by death.*

	Step-fathers.	Step-mothers.	Widows.	Wid-owers.	Loss of fathers.	Loss of mothers.	Total.
Retarded	17	11	41	5	58	16	74
Normal	5	8	22	6	27	14	41

Three times as many retarded had lost a father temporarily; two times as many retarded had lost a father permanently.

Apparently the loss of a father, even temporarily, has more effect on school retardation than the loss of a mother, pointing to the relation of income to retardation; for the main and most striking fact in this study, forced upon me in the face of many more apparent causes of retardation, is the income question.

TABLE XXXIVa.—*Income of families having normal children.*

Age.	Under $500.	$501 to $700.	$701 to $900.	$901 to $1,200.	$1,201 to $1,500.	$1,501 to $2,000.	$2,001 to $3,000.	Over $3,000.	Charity.	Successful; prosperous.
14 years	....	....	4	3	1	2	1	....	....	2
13 years	....	3	6	5	2	2	....	....	....	10
12 years	3	4	1	10	6	5	....	....	1	7
11 years	1	....	4	6	1	4	2	....	....	16
10 years	....	6	6	11	8	4	....	1	1	15
9 years	4	6	13	9	7	2	1	....	2	19
8 years	1	12	8	13	8	3	1	....	1	11
7 years	1	6	5	3	3	3	....	....	....	6
Total	10	37	47	60	36	25	5	1	5	87

TABLE XXXIVb.—*Income of families having retarded children.*

Age.	Under $500.	$501 to $700.	$701 to $900.	$901 to $1,200.	$1,201 to $1,500.	$1,501 to $2,000.	$2,001 to $3,000.	Over $3,000.	Charity.	Successful; prosperous.
15 years	4	5	3	1	2	1	....	....	....	1
14 years	7	13	15	11	8	3	....	....	5	9
13 years	1	22	20	10	4	4	3	....	4	5
12 years	6	16	16	7	3	6	3	....	4	4
11 years	9	15	9	6	8	1	....	....	9	4
10 years	8	14	10	7	4	3	....	....	8	5
9 years	7	9	12	6	4	....	1	....	6	8
8 years	4	....	4	3	....	1	1	....	3	....
Total	46	94	89	51	33	19	8	....	39	36

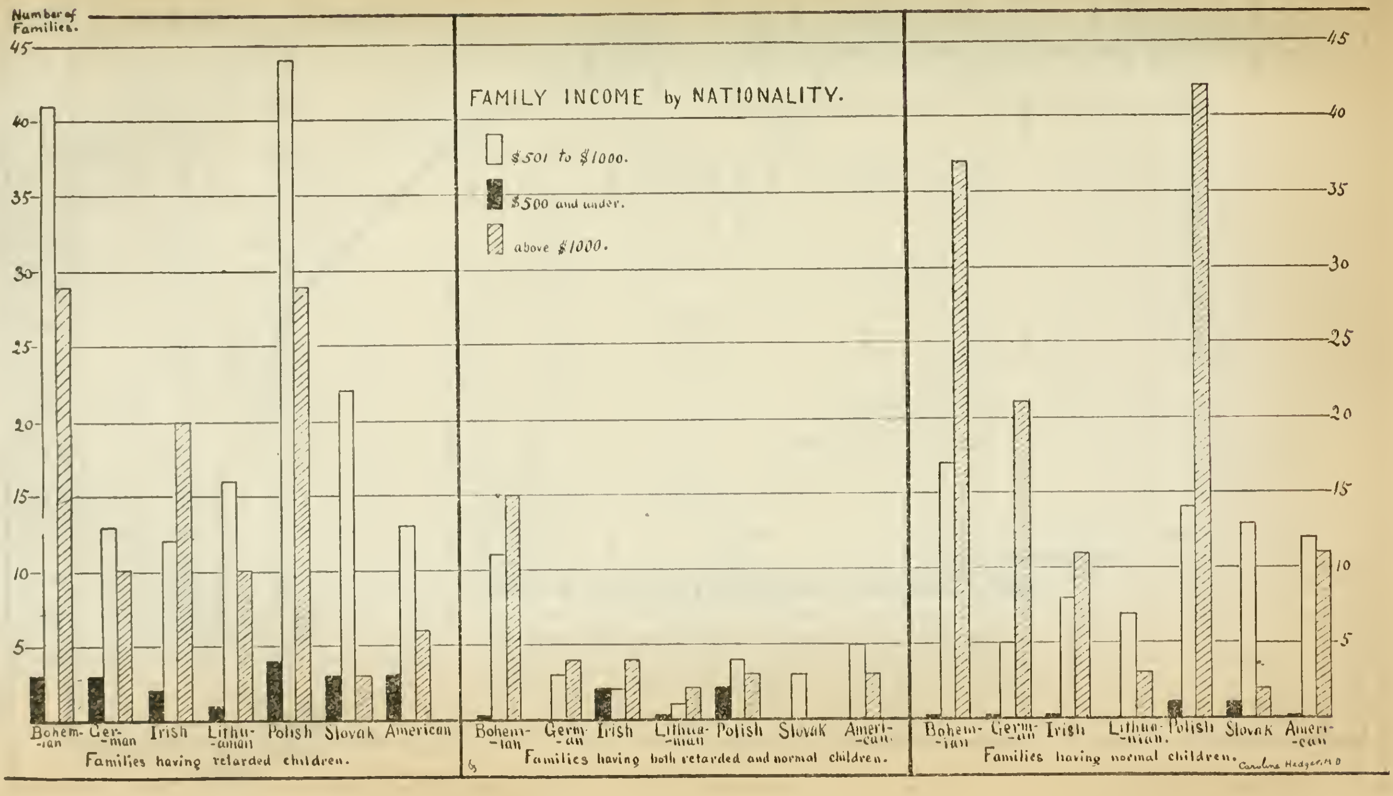
The somewhat detailed study of incomes (Table XXXIV) will explain the situation. Chart I, based on a less detailed classification, shows the same thing in a more striking manner. An income of less than $500 a year does not make up-to-grade children in this group, nor can they be made on that. An income of $500 to $1,000 makes the largest proportion of retarded children in every group but one—the Irish. An income of above $1,000 produces, in every group with two exceptions, the largest proportion of up-to-grade children. These two exceptions are the Slovaks, who apparently have hardly a living wage in their group, and the Americans, who show in all groups a low wage. As explained in the beginning of this paper, the able, successful Americans move to other neighborhoods.

TABLE XXXV.—*Relation of taxation to revenue. (The average per cent of income used for taxes, not including street improvements.)*

No.		Age.								
		7 years.	8 years.	9 years.	10 years.	11 years.	12 years.	13 years.	14 years.	15 years
51	Normal girls	2.6	2.4	3.9	3.4	2.6	2.7	2.6	3.7	......
41	Normal boys	4.2	3.0	4.2	2.9	2.7	2.5	4.4	2.6	......
31	Retarded girls	......	1.7	4.6	3.1	4.1	4.8	2.0	3.3	6.8
63	Retarded boys	......	1.8	5.0	5.7	4.6	3.2	4.0	5.9	3.4

One widow, who still had a little insurance money left to live on, was paying 13 per cent of her income, and only 2 of the whole 186 paid less than 1 per cent of their income, in taxes. The bearing on the child of this attempt to own houses on an inadequate wage can best be illustrated by a story of Miss Montgomery's: An Irish woman who had seen much better days was being called upon by the charity visitor. Her sole surviving splendor was a good green carpet in her front room, and this was, of course, commented upon by the investigator. In telling Miss Montgomery about this interview the Irish woman said: "Ah, shure, what's a bit of green carpet? Ye can nayther ate it nor wear it." And so it is with these mortgaged and outrageously taxed houses. The children can neither eat them nor wear them, but their developing years are pinched and worried, and the physical defects that could be corrected are not, because of the lack of money.

It makes no difference in what way you approach the income question, it tallies with the retardation. Notice, for instance, the curves of Chart II. These curves cover the wages of the fathers in every family of retarded and normal for which we have data. Not only does the wage curve begin lower in the retarded group, but only 30



FAMILY INCOME by NATIONALITY.

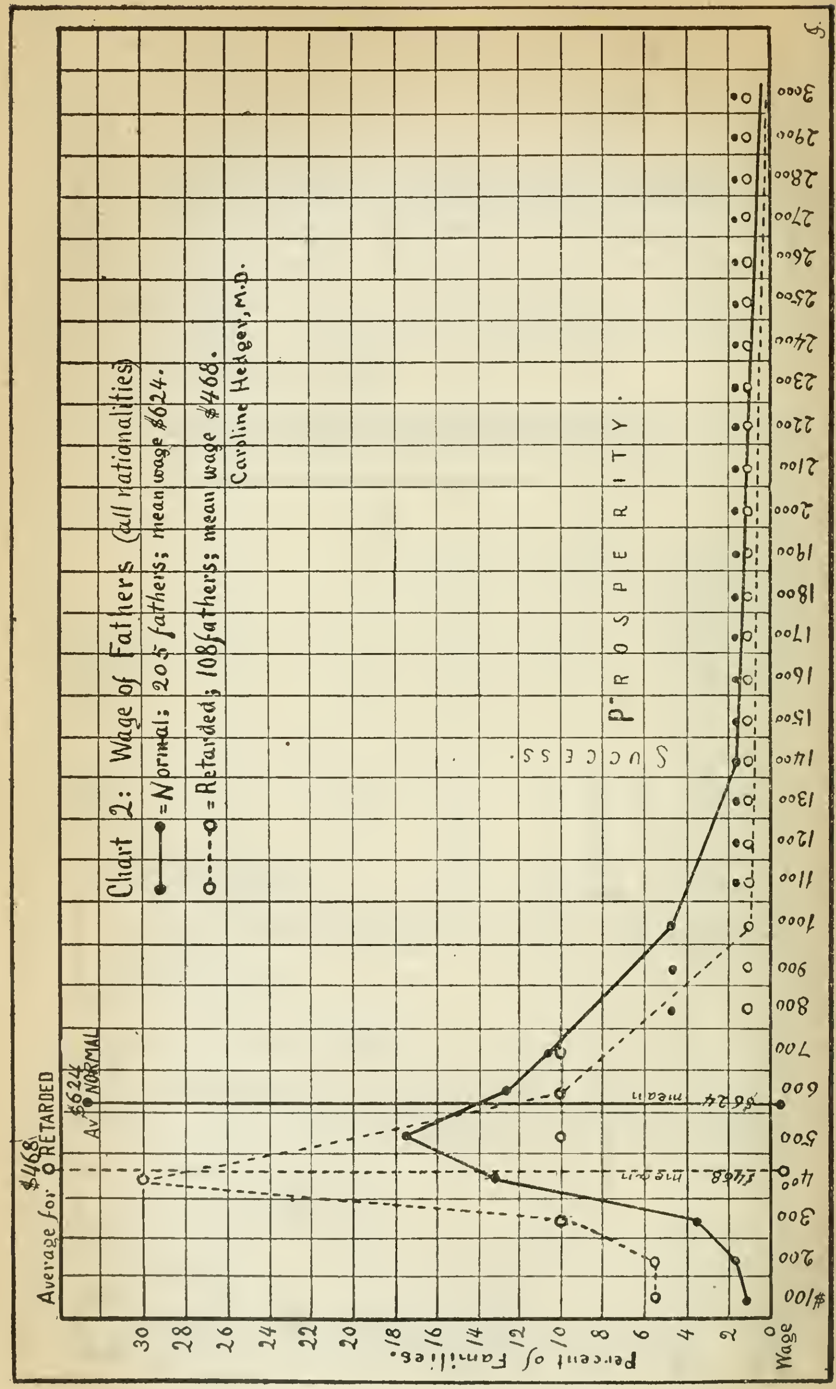


Chart 2: Wage of Fathers (all nationalities)
●—● = Normal; 205 fathers; mean wage $624.
o--o = Retarded; 108 fathers; mean wage $468.
Caroline Hedger, M.D.
SUCCESS.
PROSPERITY.
Average for $468 o RETARDED
Av $624 ● NORMAL
$624 mean
$468 mean
Percent of Families.
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Wage
$100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
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1700
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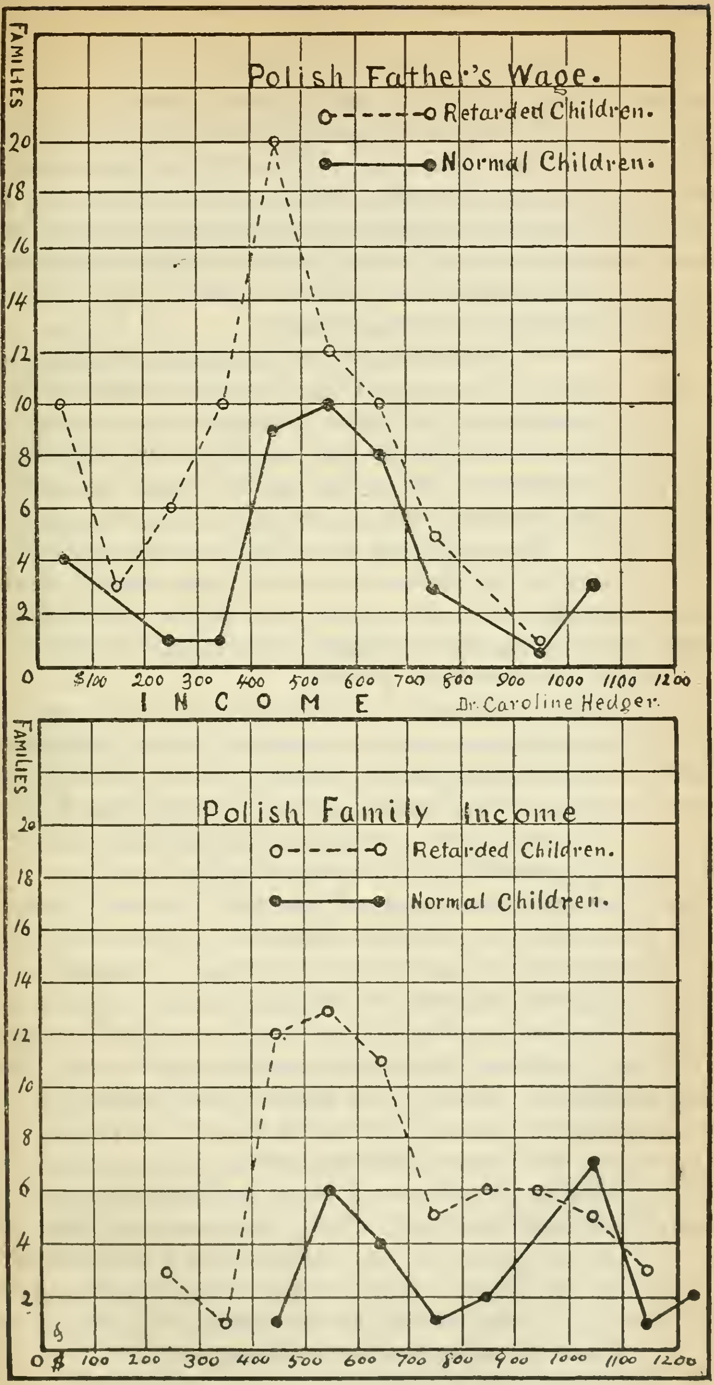
2800
2900
3000


Polish Father's Wage.
o----o Retarded Children.
●——● Normal Children.
FAMILIES
20
18
16
14
12
10
8
6
4
2
0
$100
200
300
400
500
600
700
800
900
1000
1100
1200
INCOME
Dr. Caroline Hedger.
Polish Family Income
o----o Retarded Children.
●——● Normal Children.
FAMILIES
20
18
16
14
12
10
8
6
4
2
0 $
100
200
300
400
500
600
700
800
900
1000
1100
1200

men get $780 and above, while in the normal 100 men get $780 or above.

The mean wage of the retarded group father is $468.

The mean wage of the normal group father is $624.

In the curves for the Polish group (Chart III) I wish you to observe that the taxes come out of the children themselves. The difference between the two lines of the same color is the money earned by the mother and children over and above the father's wage, which is shown by the lower line, and when such taxes as are recorded in a previous table are taken out of these incomes they truly must, in part, come out of the labor of the children.

The whole matter of retardation in this group reminds me of a cow I once bought. She was a thin, dispirited, rough, white cow, chased by every member of the herd. I took her home, and all winter long I poured corn and hay into that cavernous cow. Not a pound did she gain, apparently, but in the spring, when the cattle were turned out, there was one awful day of battle, and she emerged the boss of the herd. These children, as a whole, are bad physically, and should be improved, but it is the ones who get enough food, who have more room to live, more chance to sleep in a less crowded bed less worry from taxes and mortgages, that have the spirit and the nervous balance to make their grades.

If to this could be added, in the family, time and money for repairs to teeth, tonsils, eyes, and bent backs; if in the millennium we could add well-ventilated school buildings and a curriculum that had some relation to the individual child, we could aid the natural tendency to overcome defects, and make out of these children, now so handicapped, material of which we should be proud.

If the school ended the career of the child, we could accept with tolerable equanimity the physical condition of these children, but school does not end the story, it only begins it. And if even this meager training for life that we offer the child is curtailed—what then? And if what we offer in the school has so little interest for the child that he leaves at the first possible opportunity, have we any responsibility? Then, if the child grows ineffective, discontented with unskilled labor, idle, criminal, is the child to blame or the smug citizen who lives on the fat returns of stocks, whose money is made for him by the sweat and blood and deprivation of industrial neighborhoods like this? "As a man sows, so shall he also reap;" if you sow greed, 20 per cent on even watered stock, idleness earned by the effort of others, unjust taxation, you shall reap on the other side children like these; later, hooliganism, and increasing problems of dependency and delinquency.

THE MANAGEMENT OF TUBERCULOSIS AMONG SCHOOL CHILDREN.

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Proper measures for the prevention and control of tuberculosis among school children should be addressed not only to the protection of children during their school life and to the cure of those that have active tuberculosis, but should also aim at the education of all children in the essential facts of hygiene and, so far as possible, in the cultivation of habits of living that will protect them in later life.

The present paper does not deal with the educational side of this work, except so far as it is inseparably bound up with the care of children already ailing or actively tuberculous.

The consideration of the best methods of handling tuberculosis demands an appreciation of the habits and characteristics both of the disease and of the patients. At the outset we must remember that if every existent case of tuberculosis could be hunted up and put in quarantine, the practical elimination of the disease could be confidently expected in the lifetime of one generation.

But such thoroughness is, however, humanly impossible. The people would not put up with a quarantine of such dimensions, and it would never be possible to find the cases if the patients feared being shut up.

Many communities are, however, educated to the point of some understanding of the dangers of the disease and the need of reasonable precautions. They are ready to accept a separation of tuberculous school children from well children, and I propose to consider various plans for bringing this about.

The situation is, briefly, that the state insists upon and enforces attendance at school during the growing years of the child, and in so doing it tacitly assumes a responsibility to see to it that the child does not suffer any harm by reason of this school attendance. It is then the duty of the community to safeguard the health of school children as far as lies in its power. This responsibility and this duty are reflected in legislation requiring public schools to conform to certain requirements in building and sanitary arrangements and to provide proper inspection of their pupils in order to protect them from the needless spread of contagious diseases.

Considering these facts, it is obviously necessary for cities and towns to devise some way in which the tuberculous children may be kept from contact with the well.

In approaching this problem the school authorities find themselves confronted by two classes of children: First. Children who are anemic, run down, and undernourished, in whom no signs of tuberculosis can be detected, but whose condition suggests latent tuberculosis. The disease appears so frequently in children of this class that they are commonly spoken of as in the pretubercular stage of the disease. Second. Those who are actively tubercular and in whom the disease can be positively diagnosticated.

Children in the first of these classes are not dangerous to other children. They can associate intimately with the well children. They are, however, liable at any time to become actively tuberculous and so dangerous. Life in the open air has proved its usefulness in restoring to health both adults and children who are debilitated, and in many places these children have been provided with out-of-door schools and with open-air rooms.

The out-of-doors treatment of these children is no longer an experiment. It has been fully tried in many places and has abundantly proved its usefulness. These trials have demonstrated that the condition of health is greatly bettered, and have shown that the mental capacity of the children and their ability to learn their lessons is quite surprisingly increased. It has been found that these children in the open air have been found to accomplish their tasks with less hours of study than children in like grades who are studying in closed rooms.

This experience ought to open the eyes of school authorities to their shortcomings in the matter of school ventilation, and the benefits of this discovery should be felt through the whole school system.

In addition to this provision of proper surroundings for these weakling children, it has been not unusual for school committees to supply a lunch and sometimes also to supply warm coverings to needy and scantily clothed children during school hours in cold weather. These are both necessary adjuncts to the treatment of these undernourished children, but the difficulty and expense of providing them has deterred many communities from establishing open-air schools. This food and the extra wraps needed should manifestly be paid for by well-to-do parents, by parents who are able to pay for the medical and other care of their children's health. It is equally certain that they should be supplied to children whose parents are unable to pay for the medical aid they need and who resort, therefore, to dispensaries and public hospitals.

It has been objected that this is a forward step in socialism, and this is undoubtedly true; but is it a valid objection? Compulsory education was a forward step in the same direction, and has the world regretted that? This proposed advance in the care of the children whose education the state has assumed is a measure for the protection of the community, for the improvement of its health, for the limitation of an insidious contagious disease, and, as such, it is a proper measure for which to spend the public money.

The distribution of this help should of course be arranged in such a manner that there should be as little pauperizing effect as possible on the recipients of the community's bounty. It would not be a startling innovation in a community supplying school books to its poor children. To reduce the pauperizing effect to a minimum it might be well, whenever it could possibly be arranged, to have the parents pay a small sum for the lunches.

The children who were given this extra care in the schools would naturally be under the especially careful watch of the school nurses. These nurses would follow them to their homes and would thus have the opportunity to see the home conditions, to discover how they had contributed to bring on the debilitated condition, and to advise the parents and assist them to correct any hygienic mistakes that were being made. The out-of-doors school, then, in order to produce the best results, should be supplemented by a good system of inspection by nurses.

What is an out-of-doors school, and how far does an open window or windows fulfill the necessary conditions?

We find many ventilating engineers who claim that, by carefully adjusted apparatus with forced drafts through apertures whose capacity has been arranged by close calculation, a better quality of air can be provided than by any system of open windows. These claims are based on the supposition that the prime requisite is to supply a calculated amount of unused and fresh air and to remove air that has been used. Their test of the quality of the air in a room is by the determination of the amount of CO_2.

Unfortunately, very little is known as to the characteristics of air which make it wholesome and stimulating. We know that temperature, humidity, and motion have much effect in determining whether air is agreeable and healthful. We know, too, that the amount of CO_2 in air is not an unfailing guide as to its quality in this respect.

Out of the obscurity which clouds this subject of good and bad air one fact emerges with tolerable clearness, and that is that out-of-door air has a healthful quality which confined air never has, no matter how carefully compounded. A man who has been living out of doors notices a stuffiness in the air of a room with all the windows open. There is some quality of freshness and stimulation in the open that is lost in confined spaces. On a summer's evening, after a hot day, compare the air on an open piazza with that inside the house, and consider the length of time it takes for the cool evening air to penetrate and displace the hot stagnant air within a house whose every window is open. By such a comparison as this we shall be convinced that an out-of-door school has advantages over a room with all the windows open, and that we should aim at a thoroughly out-of-doors arrangement, one which can be protected from violent wind and rain, but the sheltered sides of which shall be fully open.

When the best arrangement cannot be provided, rooms with all of the windows open should be used. Such rooms will be of little use, however, unless they are in charge of teachers who are intelligent advocates of open air, for otherwise the slightest severity of the weather brings a closing of the windows.

The open-air school will act as a strong preventive measure against tuberculosis, and, by improving the health of the undernourished, will check the development of many cases. It will thus cut down the numbers of the other class we have now to consider; namely, the active, " open," contagious class.

It is quite clear that children with open communicable tuberculosis should be separated from the healthy children for two reasons. First, because the State or community is responsible for the reasonable protection of the children whom it forces to attend school; and, with our present knowledge about tuberculosis, it is an almost criminal disregard of this responsibility to allow open tuberculous cases to herd with well children in our school-rooms.

Secondly, these children should be segregated on their own account. They need an even more rigidly carried-out open-air treatment than the debilitated children. They need extra feeding. They need a careful regulation of their work and rest hours, under the guidance of a physician, and the constant care of trained nurses experienced in tuberculosis. They must be carefully taught the precautions needed to prevent their giving the disease to others. In short, they need hospital care and treatment, and their teaching and study must be regarded as of secondary importance.

How can this care and supervision be most effectively and at the same time economically provided?

Here we come to a point in our problem where the human element must be considered. It is quite plain that if all of these children could be collected in hospitals this would give the best sort of isolation of the disease. Unhappily, the parents will not send their children away from home, and without their cooperation this kind of quarantine is impossible.

Facing a problem of this kind, the Boston Association for the Relief and Control of Tuberculosis established an outdoor camp, where the children pursued their studies, and at the same time were under the care of the doctors and nurses in charge of the camp. From this beginning was gradually evolved the Boston Hospital School, which, through the help of the park commission, was comfortably housed in Franklin Park. This experiment proved so successful that the city of Boston, through the combined action of its school board and its Consumptive Hospital trustees, took the school under its charge and placed the responsibility for its management in the hands of the Boston Consumptive Hospital trustees. thus recognizing that this institution was a hospital rather than a school.

I do not purpose here to consider at any length the detail of treatment at this hospital school. It was practically a day camp at which the children were occupied with study only so far as was thought good for their health. Many parents approved the plan and sent their children. Although situated on the outskirts of the city, the attendance was satisfactory. The children did well. The nurses, trained in tuberculosis work, followed the children to their homes, and were able in this way to exert some influence upon their home surroundings in a manner to obtain for them better care, and to diminish as far as possible the infection of those around them.

An excellent account of the work in this school is contained in a paper published in the Fifth Annual Report of the American Association for the Study and Prevention of Tuberculosis. by Dr. James J. Minot and Miss Hyams. Later, in the Boston Medical and Surgical Journal, August, 1911, Dr. Edwin A. Locke and Dr. Timothy J. Murphy published a very careful study of the work and of its results.

On the 31st of January, 1911. the Boston Consumptives' Hospital trustees closed the school, thus putting an end to this pioneer work which had met with the approval of competent persons in all parts of the country, and which had taken a large number of tuberculosis children out of the public schools and cared for them under conditions which reduced the risk of infection in the community to a minimum.

The chairman of the board, who cast the deciding vote which closed this school, when asked how these patients were to be cared for after the closure of the school. said. "At day camps and hospitals," and declared that it was the intention of his trustees to so provide for then. Under these circumstances it is interesting to know what became of these patients after they were turned out of the hospital school. Drs. Locke and Murphy attempted to find the cases. and were successful in finding 156 out of the 174 cases treated at the school during the year previous to its closure. Of these cases exactly 19, or 10.91 per cent, went to day camps or hospitals; 91. or 58.33 per cent, went back into the public schools; 4, or 2.56 per cent. had died; and the remaining 42 patients, or 26.92 per cent, had gone back into the community.

This gives a striking illustration of the far greater usefulness to the community of a hospital school than of a day camp or hospital. Only a little more than 10 per cent of the children whose parents willingly sent them to a hospital school were afterwards sent to day camps and hospitals. The large proportion of these cases that went back into the public schools, to there infect well children, are sufficient basis for a serious indictment of the city government that subjects well children put under its care to such unnecessary risks. The results of this experience should convince any fair observer that the hospital school is the most efficient means as yet discovered for safely handling tuberculous school children. In a large city several hospitals of this type should be supplied, and so placed as to be accessible to the school population.

SCHOOL INSPECTION.

We have hitherto considered the means at our disposal of caring for the children threatened or affected with tuberculosis after they have been discovered. Obviously, any plan of caring for these children must have its foundation in a thoroughly satisfactory system of school inspection.

It is not proposed here to discuss the details of school inspection, for this must vary according to local conditions. In large cities the task of school inspection is a large one, and since a large proportion of the children belong to a class in the community which does not employ a family physician, school physicians must play a considerable part in any complete scheme. Even, however, in large places it has been found by increasing experience that more and more of the work can safely be delegated to nurses. So far as this work has to do with the early discovery of tuberculous children many experienced physicians, expert in this class of work, feel a greater reliance upon the school nurse for this detection of early cases than upon the school physician. While the final decision as to the existence of tuberculosis must be made by a physician, it is the watchful nurse, constantly among the children, who usually first discovers that the child is out of health and needs attention, and so brings the case to the physician for thorough examination. Many of the cases which come under the head of anemic, debilitated children show no signs, and the close watchfulness of the nurse is more likely to discover children in this class than the cursory observation of a school physician passing his eye rapidly over many children.

In conclusion, then, it appears that a safe system of care for tuberculous children in the schools is a duty that the public assumed when it made school attendance compulsory. That duty the school authorities can not evade, and they should face it squarely.

Any proper plan for handling tuberculosis must rest on a thorough and efficient system of school inspection. Every school should have provision for out-of-door study for all of its debilitated children. These children should have extra feeding. This is a medical necessity of the case. Whether this food should be supplied by the parents, by some outside charitable source, or by the town is a ques-

tion which must be settled according to the circumstances of each case, but the settlement should not be shirked.

Children having active tuberculosis should be separated from the other children and should be cared for as sick children. The most efficient plan for accomplishing this in cities of considerable size is the hospital school, and in a large city these should be divided in different sections of the city, so that the children shall not have far to go from their homes.

KINDERKRANKHEITEN WÄHREND DES SCHULLEBENS.

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Die Diskussion über die im Schulleben der Kinder vorkommenden Erkrankungsformen, und die daran sich knüpfenden, über den krankmachenden Einfluss des Schullebens selbst, ist so wenig neu, dass man schier kaum begreifen kann, wie dieselbe doch immer noch wieder zum Gegenstand einer Erörterung in fachwissenschaftlichen Kreisen genommen werden kann. Es ist, sollte man meinen so ziemlich alles was über den Gegenstand gesagt werden kann, bereits gesagt, und es wäre, sollte man weiter meinen, besser daran getan, das nun einmal bekannt Gewordene in die Tat überzuführen. Gewiss schreitet mit dem gesamten Fortschritt der wissenschaftlichen Medicin auch die Kenntnis über einzelne Beziehungen zwischen Schule und Krankheitsentwicklung und Krankheitsform vor; auch kann es nicht einmal schwer halten, dieselbe dem sonst erworbenen Fortschritt anzupassen und die Folgerungen weiterhin in die Tat umzusetzen. Somit werde ich auch hier kaum in die Lage kommen können, mit wirklich neuen Tatsachen hervorzutreten, es kann vielmehr meine Angabe nur sein, in einem kurzen Referat den augenblicklichen Stand der Dinge zu kennzeichen.

Wenn Sie, meine Damen und Herren, den im Jahre 1786 erschienenen 2ten Band von Johann Frank's System einer vollständigen medizinischen Polizei—man nannte damals etwa alles das "medicinische Polizei," was wir jetzt unter dem Begriff der öffentlichen Gesundheitspflege zusammenfassen—zur Hand nehmen, so finden Sie ein Kapitel darin von "Schulen und Unterricht der Jugend in Rücksicht auf das Recht der Kinder und des Staates" und hierzu das Motto:

> Ihr lehrt Religion, Ihr lehrt sie Bürgerpflicht,
> Auf Ihres Körpers Wohl und Bildung seht Ihr nicht.

Andere Kapital handeln von der Gesundheitspflege der lernenden Jugend, von zu früher Anspannung der Jugend, von gesunder Bestellung des Schulwesens, von Wiederherstellung der Gymnastik, also eine Kette von Abhandlungen über Schulhygiene, in welchen auf all die Schäden hingewiesen wird, welche der Jugend während des Schullebens und aus dem fehlerhaft bestellten Schulwesen zu erwachsen vermögen, und wie man aus dem Motto zu erkennen vermag, ist der Autor nicht abgeneigt den Causalnexus beider Vorgänge—Schulleben und Schädigung der Jugend anzuerkennen. Mag man auch immerhin annehmen, dass die damalige Zeit, noch nicht vorgeschritten genug, tatsächlich allen Grund hatte, die Kinder vor der Schädigung durch die Schule zu schützen, so darf doch nicht übersehen werden, dass sich der Kampf um diese Frage durch das ganze 18te Jahrhundert hindurchzieht. In Deutschland insbesondere wo das Schulleben ganz besonders eifrig cultiviert worden war, wo der Schulzwang die Kinder gesetzlich vom Abschluss des 6ten Lebensjahres an in die Schule brachte, und wo in den höheren Schulen durch die verschiedenen Examina, insbesondere durch das umfangreiche und strenge Maturitätsexamen, ohne welches der Zugang zu dem höheren Studien auf die Universitäten und zu höheren Berufen verschlossen war, ist dieser Kampf auf das Lebhafteste geführt worden. Es darf erinnert werden an die schweren Vorwürfe gegen das Schulleben, die von Lorinser in Berlin 1836 erhoben werden, der Störungen der Verdauung und Blutbereitung, Stockungen in den Unterleibsorganen, krumme Haltung und fehlerhafte Beeinflussung der Muskulatur, Kurzsichtigkeit, Verarmung und Abstumpfung des Geistes, Zurückhaltung der naturgemässen Ausbildung des Körpers, dem Schulleben der Kinder als Schuld zuschreibt.

Welche Literatur ist seither herangewachsen! Nehmen Sie mein eigenes Handbuch der Schulhygiene zur Hand, welches in Deutschland in 3. Auflagen erschienen ist, so werden Sie überrascht sein, zu erkennen, wie umfangreich dieselbe ist, die ich allein angebe; dazu nun aber noch die anderen Werke über denselben Gegenstand, in Deutschland von Burgerstein und Netolitzki, von Wehmer, Kotelmann u. A., in England von Dukes, in Frankreich und in Amerika von zahlreichen Autoren mit ihren Literaturverzeichnissen, nehmen Sie dazu die zahlreichen Journale, die denselben Gegenstand behandeln, und "last, but not least," die Publikationen der grossen internationalen Kongresse für Schulgesundheitspflege in Nürnberg, London aus den letzten Jahrzehnten, so übersehen Sie ein überraschend mächtiges Feld von Arbeit und Kampf bis auf den heutigen Tag. Wie aber die Frage im Grossen in diesem Augenblick steht, mögen Sie am besten aus der Tatsache abmessen, dass auf dem letzten, diesem vorangegangenen internationalen Kongresse in Berlin, 1907, in der gleichen Sektion, in welcher wir soeben hier versammelt sind, die Geister in einer der allerwichtigsten Fragen, in der Frage der Ueberarbeitung in der Schule aufeinanderplatzten, indem der eine der Referenten, Czerny, zu dem Ausspruch gelangte, er kenne aus seiner Erfahrung keinen einzigen Fall, in welchem sich eine Schädigung eines gesunden Kindes durch Ueberarbeitung in der Schule feststellen liesse, vielmehr gehörten alle Kinder, welche angeblich einen solchen Schaden erlitten hätten in die Gruppe der psychopathischen und neuropathischen Kinder, während der französische Conferent Herr Mathieu aus Paris eine grosse Kette von Uebeln, die aus der *malmenage physique* und der *surcharge des horaires de travail intellectuel* hervorgehen, darunter Kopfschmerz, Schlaflosigkeit, Nasenbluten, Anämie, Schwindel, usw. aufzählt, und auch die Discussion nach beiden Richtungen hin ihre Vertreter aufwies. So bleibt also trotz all dem Vorangegangenen und anscheinend Gewonnenem doch nichts übrig, als zu der Frage Stellung zu nehmen.

Sie ist ja augenscheinlich eine zweifache. Einmal die Aufstellung und Beleuchtung der Krankheitsformen, welche während des Schullebens an den Kindern vorkommen und zweitens die Beleuchtung der causalen Beziehungen zwischen Schulleben und Krankheit, falls auch nur ein Verdacht eines solchen Causalnexus aufzukommen vermag.

Die erste der Fragen ist eigentlich, streng genommen, einfach damit zu beantworten, dass von Krankheiten wohl keine einzige vorkommt, welche das kindliche Alter überhaupt zu treffen vermag, die nicht auch in der Zeit des Schullebens auftreten könnte. Also, "during school life," kann das Kind wirklich jedwede Krankheit treffen, und die hauptsächlichsten sind natürlich diejenigen, die wir auch sonst, völlig ausserhalb des Schullebens auch bei Kindern, die noch niemals die Schule kennen gelernt hatten, also bei den Kindern noch wilder und unberührter Naturvölker vorfinden, dazu gehören in erster Reihe die eigentlichen Infektionskrankheiten, wie acute Exantheme, Diphtherie, Keuchhusten, sodann die akuten Erkrankungen der Respirationsorgane, Pneumonien, u. s. w., der Digestionsorgane, wie Diarrhöen von Indigestionen u. s. w., schliesslich auch die chronischen Erkrankungsformen, wie Scrofulose und Tuberkulose. Warum sollten auch gerade die Schulkinder von diesen Krankheiten ausgenommen sein? Die Schule ist doch nicht, und hat garnicht die Aufgabe, eine Schutzvorrichtung gegen Erkrankungen des Kindesalter darzustellen, wenn sie gleich, wie ich dies einmal in einem Vortrage[1] dargetan habe, tatsächlich durch ihre Einrichtungen und durch die physische und moralische Beeinflussung der Schulkinder, dazu beizutragen vermag, auch den Gesundheitszustand der Kinder zu heben und dauernd zu bewahren. Also damit würden wir unserer Aufgabe nicht näher kommen. Augenscheinlich ist es die Erörterung der Möglichkeit von Beziehungen von Schulleben zur Krankheit, mögen dieselben nun engere und nähere, oder fernere nur im Wesen der Dinge gebotene sein, in die wir einzutreten haben.

Wir tun gut bei einer so gestellten Aufgabe denselben Weg einzuschlagen, den wir auch sonst in der Klinik zu gehen gewöhnt sind, wenn wir bemüht sind, über die ätiologischen Faktoren einer uns gegenübertretenden Krankheit zur Klarheit zu kommen, d. i., dass wir der Reihe nach die in die Erscheinung getretenen besonderen Eigenschaften des Milieus studieren, in welchem der Betroffene sich bewegt. Auf das Schulleben angewendet haben wir uns zunächst dem Schulbau, dem Aeusseren, wenn ich sagen soll, der Schule zuzuwenden und hier begegnen wir der Möglichkeit, dass schon Fehler der äusseren Anlage der Schule dazu beitragen können, durch ungesunde Beeinflussung der in der Schule sich aufhaltenden die Gesundheit derselben zu schädigen. Darf man doch nicht vergessen, dass man es bei Kindern im Schullebensalter, also in der Zeit vom 6ten bis 14ten Lebensjahr und etwas darüber, *a priori* mit Organismen zu tun habe, die den Einflüssen des Milieus ganz besonders leicht unterliegen, weil sie augenscheinlich sehr sensibel und empfindlich sind.

Ohne in das Detail der hier einschlägigen Fragen zu dringen, die ja längst in den Büchern über Schulhygiene festgelegt sind, soll immer hervorgehoben werden, dass Fehler des Untergrundes, wie Sumpf oder infizierter Boden, Feuchtigkeit der Wände und Undurchlässigkeit derselben, zu geringe quadratische Abmessung des Raumes für das einzelne Kind, zu geringe Höhe der Räume für die Verhältnisse des nötigen kubischen Raumes, Verfehlung in der Abmessung der Fensteröffnungen im Verhältnis zur quadratischen Bodenfläche und die Beschattung dieser Fenster durch hohe Bäume oder lichtbeschränkende hohe Nachbargebäude, endlich fehlerhafte Heizung- und Ventilationsanlagen, Mängel in Breite und Höhe der Corridore, der Schulhöfe, Mängel an Waschanlagen und Waschgelegenheiten Anlass geben, dass Kinder, die doch täglich mehrere Stunden in solchen Schulen sich aufhalten müssen, schliesslich ebenso Schaden von diesem Aufenthalt haben, wie Arbeiter, die in fehlerhaft gebauten und schlecht gehaltenen Fabrikanlagen tätig zu sein gezwungen sind; des Kindes Arbeitsstätte ist ja eben auch die Schule. Kommt nun noch hinzu, dass auch die Ausstattung der Schulräume verfehlt ist, die Subsellien falsch konstruiert und in Grössenverhältnissen verpasst, dass ihre Aufstellung zweckwidrig ist, so vermag dies noch mehr dazu beizutragen, den Kindern zu Schaden zu sein. Erkrankungsformen der Respirationsorgane, der Muskulatur und des Körpergerüstes, ebenso auch des Sehorganes können, wenigstens theoretisch betrachtet, bei dem langen Aufenthalt der Schulkinder aus so verfehlt gestalteten Schulen hervorgehen.

Den äusseren Schuleinrichtungen sind nun die des inneren Schulbetriebes, des eigentlichen Unterrichts an die Seite zu stellen.

Allzu lange Dauer des Unterrichts, mangelhafte Anwendung und zu geringe Dauer der Schulpausen, die Häufung von Sitz- und Schreibstunden, dazu bei ungeeignetem Druck der Lesebücher und fehlerhaftem schlechten Schreibmaterial, verfehlte Schulpläne, die Häufung des Unterrichts in besonders schwierigen den kindlichen Geist stark in Anspruch nehmenden Gegenständen, vieles Auswendiglernen lassen, harte strenge Behandlung, ungeeignete und selbst schmerzhafte Schulstrafen, Fernhaltung von den regelmässigen Mahlzeiten, übermässig zugemessene Hausarbeiten sind die wichtigsten im inneren Schulbetrieb zur Geltung kommenden Schäden, die an dem Befinden der Kinder sich bemerklich machen. Hier ist es der als Ueberbürdung gekennzeichnete Complex von krankhaften Erscheinungen, der der Schule zugeschrieben wird, und selbst schwere Psychopathieen sind es, deren Ursprung ihr gern als Schuld untergelegt wird. Letzteres freilich, wie hier sogleich hervorgehoben werden muss, zu Unrecht; indess werden hier doch die Anlässe zur Entstehung von Kurzsichtigkeit, fehlerhafter Haltung und Anomalieen der gesamten Entwickelung gesucht.

Als dritter schädigender Faktor endlich kann im Schulleben das notwendig gegebene Beisammensein zahlreicher für Infectionskrankheiten Empfänglicher ätiologisch in Betracht gezogen werden. Naturgemäss wächst mit dem Beisammensein vieler Kinder an sich schon die Gefahr der Contagion, lediglich durch die enge Berührung. Auf diesem Boden des unvermeidlichen so vielfach wiederholten und andauernden Contactes wird die Einschleppung von Contagien zu einer grossen Gefahr, hier wirken die Bacillenträger, selbst anscheinend gesund, und doch die Träger der Krankheiten. als wirksame Erzeuger von Epidemien.

Dies sind in Kurzem Abriss die Verhältnisse, die in Betracht gezogen werden müssen. wenn wir von den Krankheiten der Kinder während des Schullebens im Sinne des Causalnexus zwischen Schule and Krankheit sprechen wollen.

Lassen Sie uns nun in Kürze diejenigen hauptsächlichsten Krankheitsformen ins Auge fassen, welche bis jetzt in der Regel zum Schulleben in Beziehung gebracht werden.

Obenan ein Symptomencomplex der nicht als eigentliche abgegrenzte Erkrankungsform in die Erscheinung tritt, aber unverkennbar zusammengehörig, ein immerhin charakteristisches Krankheitsbild darstellt " die Uebermüdung und Ueberarbeitung."

Blässe des Gesichts, der Haut und Schleimhäute, Welken und Schlaffheit der Muskulatur, Kopfschmerz, Appetitlosigkeit, Erbrechen, Schlaflosigkeit, geistige Abspannung, Zerfahrenheit und Lernunfähigkeit, Unlust und weinerliche Stimmung, Angstgefühl, Unregelmässigkeit des Pulses und Herzklopfen und sonst bei den Kindern ungewohnte Erscheinungen von Unsauberkeit, wie Enuresis auch eine gewisse Anfälligkeit für acute Krankheiten, wie Anginen und andere Infektionskrankheiten lassen uns in der Gemeinsamkeit ihrer Erscheinung aber unter besonders starkem Hervortreten einzelner der genannten Wandlungen, eine mehr oder weniger rasch hervortretende Minderwertigkeit des physischen und psychischen Wesens der Kinder erkennen. Keine Alterstufe bleibt verschont, schon bei den jüngsten Schulgängern kann sich dieselbe bemerklich machen, ganz augenscheinlich entstanden unter dem Einfluss des mit den strengen Anforderungen von Pflichten, Stillsitzen, Gehorsam, erzwungene Aufmerksamkeit, Fremdartigkeit der Beschäftigung, u. s. w. an das junge Kind herangetretenen Schullebens. Mehr freilich und häufiger sind ältere Kinder die Beteiligten, so besonders die an sich durch die eintretende Pubertät besonders Disponirten, bei denen die von der Natur ins Werk gesetzten physischen Wandlungen sich mit den in Schulpflichten und Schulbelastungen gegebenen Noxen compliciren; so vielleicht am meisten, bei den in den höheren Schulklassen wirklich schwierigeren Anforderungen der Schulpflicht Ausgesetzten, oder bei den gar den Examina gegenüberstehenden Jugendlichen. Gewiss kann man nicht alles der Schule allein als Schuld zuschreiben wollen; gewiss ist das Gros der Kinder von den genannten schweren Beeinflussungen frei und mögen von Hause aus noch andere, in den Kindern selbst schon liegende Anomalien mittätig sein, die genannten Wandlungen zu erzeugen; dies schliesst aber nicht aus, dass dem Schulleben doch ein gut Teil der genannten und aufgezählten Krankheitsvorgängen mit auf Rechnung geschrieben werden muss.

Wer also, wie Czerny dies tun will, nur an Neuropathen oder Psychopathen, den Symptomencomplex der "Ueberarbeitung" (overwork) beobachtet haben will, tut den Kindern und den Eltern Unrecht und macht die Schule in ungerechter, dieselbe bevorzugender Weise, frei von Schuld. Ich selbst habe in dem obern bereits von mir erwähnten Artikel in ausgiebiger Weise hervorgehoben, wie die Schule gewiss nicht alle und die ganze Schuld trifft, und wie die Schule sogar dazu beitragen kann, die Kinder den neuropathischen Anlagen durch geordnete Tätigkeit und Anspannung, durch Regelmässigkeit der Pflichtanforderungen, durch Eingewöhnung an Reinlichkeit, Ordnung und Pflicht, durch Belehrung über allerlei der Jugend drohende Schäden wie beispielsweise den Alkoholgenuss, sexuelle Irrungen, u. s. w. zu entreissen und gesunden Entwickelungen entgegenzuführen; aber die Schule wirklich und völlig frei machen zu wollen von dem Vorwurf der Uebermüdung und Ueberanstrengung der Kinder in dem von mir gekennzeichneten Sinne, heisst das Kind mit dem Bade ausschütten wollen. Ich sehe hierbei sogar völlig ab von den ungemein zahlreichen und geistvollen theoretischen Studien über Uebermüdung mittelst der Mossoschen Ergographenversuchen, oder mittelst der ästhesiometrischen Methoden oder den psychischen Arbeitsmethoden, über deren Deutung und Werthung zahlreiche Autoren weit über das Ziel hinausschiessen; wenn diese halb wahr und unrichtig erscheinen so halte ich mich doch lediglich an die einfache Beobachtung des ärztlichen Praktikers. Wer aber aus den eigenen Erlebnissen der Praxis heraus zu urteilen vermag, und genügende Erfahrung hat, wird sich dem nicht verschliessen kännen, dass es eine wahre und wirkliche Schulüberarbeitung und Uebermüdung giebt, und dass man allen Anlass hat, derselben Aufmerksamkeit zuzuwenden, die Kinder durch geeignete Massnahmen der Entlastung und Entspannung, rechtzeitig denselben zu entreissen.

Die zweite beachtenswerte Anomalie, die im Verlauf des Schullebens bei den Kindern in die Erscheinung tritt und die wir schon seit langem mit demselben in Causalnexus gebracht haben, ist die Myopie. Bis ins erste Decennium des vorigen Jahrhunderts hinein gehen die Beschuldigungen zurück, dass die Schule im Stande sei, Myopie bei den Kindern zu erzeugen, dass schlechte Schulbeleuchtung durch verfehlte Fensteranlagen, viele Lese- und Schreibarbeit an sich schon, durch die Naharbeit, kleine und schlechte Druckschrift, mangelhaftes Lese- und Schreibmaterial, schlechte und dürftige künstliche Beleuchtung die Faktoren sind, welche bei Entstehen der Myopie mitwirken, wenn nicht gar dieselbe wirklich hervorrufen. Ich darf hier erinnern an die bereits im Jahre 1812 von James Ware, der Royal Society of London, gemachten Mitteilung, dass von den in der Zeit von 1803–1807 in Oxford studierenden jungen Leuten 32 Brillen gebrauchen mussten, während unter 10,000 nichtstudierten Soldaten kein einziger Kurzsichtiger war; ich darf erinnern an ähnliche Untersuchungen aus den 40er Jahren in den deutschen Schulen in Baden, Bayern u. s. w., an die Untersuchungen von Szokalski in Paris aus den Jahren 1834–1845 u. s. w.; man findet darüber in meinem Handbuch der Schulhygiene die nötigen Aufzeichnungen.

Eine volle Klarstellung der Verhältnisse fand freilich erst statt durch die ausgedehnten Untersuchungen des deutschen Augenarztes Herrman Cohn, im Jahre 1867, an über 10,000 Schulkindern beobachteten und nachgewiesenen Fällen von Myopie von Schulkindern; und bei der unbedingt vorhandenen Möglichkeit durch angestrengtes und andauerndes Naharbeiten bei schlechter Beleuchtung die Gestalt des Bulbus nach der Richtung der Änderung der brechenden Medien im Sinne der Myopie zu verbilden, is aller Grund vorhanden ist, der Frage auch weiterhin sorgsamste Aufmerksamkeit zu schenken. Dass, zum Glück, die im Schulleben zu tage tretende Form und Grösse der Myopie nicht zu den gefahrdrohenden gehört, dass die eigentlich malignen Myopieformen tatsächlich eine krankhafte meist erbliche Veranlagung des Auges voraussetzen, kann nicht daran hindern, von den Kindern dennoch alle jene Schädlichkeiten fern halten zu sollen, welche im Verdacht sind, an der Erzeugung der Myopie mitzuwirken. Wir haben allen Grund dazu, unseren Schulkindern viele Sitz- und Schreibarbeit nach Möglichkeit, fern zu halten, die Schulbeleuchtung sowohl in der Gestaltung und Grösse der Fensterflächen, ebenso in der Anordnung der Fenster möglichst günstig zu gestalten, die künstliche Beleuchtung womöglich völlig aus der Schule zu verbannen, indem wir nur die Tagesarbeit nutzen und endlich unseren Kindern durch vieles Bewegen im Freien, im hellen lebendigen Tageslicht störenden Schuleinflüssen zu entreissen. Es wird vielleicht interessieren, dass der Deutsche Kaiser auf das Allerlebhafteste sich der Kenntnisnahme der auch für die Wehrhaftigkeit der Nation so überaus wichtigen Frage zugewandt hat, und mit Nachdruck auf die Bedeutung und Notwendigkeit der Fürsorge für Beseitigung der den Augen der Schulkinder drohenden Schäden hingewiesen hat.

In einem gewissen Zusammenhange mit der Myopiefrage steht eine andere nicht minderwichtige, die Frage der Entwickelung der Skoliose und der anderen Wirbelsäuleverkrümmungen im Alter des Schullebens der Kinder. Die Verkrümmungen der Wirbelsäule hat man ähnlich wie die Myopie in einen ernsten Causalnexus zum Schullebem der Kinder gebracht, so dass man sie als echte Schulkrankheiten zu bezeichnen gewohnt ist. Wer weiss und es kennt, dass sich gewisse anormale Gestaltungen der Wirbelsäule und der Extremitäten an bestimmte Berufsfähigkeiten knüpfen, dass der Tischler eine hohe Schulter, der Bäcker die Beine, der Bureauschreiber den krummen Rücken zur Schau trägt, u. s. w., dem wird nicht verwunderlich sein, dass man auch den Schulberuf der Kinder—denn schliesslich ist doch für eine Reihe von Jahren der Schulbesuch der Beruf der Kinder—mit derartigen Umstaltungen des kindlichen Körpers in Beziehung gebracht hat; und es darf uns um so weniger Wunder nehmen, wenn wir aus den Erfahrungen der am meisten beschäftigten Orthopäden heraus, die Tatsache kennen lernen, das die weitaus grösste Anzahl von Skoliosen, also der schwersten der hier ins Auge gefassten Anomalien im Schulalter entstehen. Wenn Männer wie Karewski unter 756 Fällen von Skoliosen 563 im Alter von 6–15 Jahren, also im Alter des Schullebens haben entstehen sehen, oder wenn Kocher beispielsweise die Skoliose als eine echte Schulkrankheit bezeichnet, so hat man doch wohl Grund genug, der Frage nach der bezeichneten Richtung hin näher zu treten.

Auch die Verkrümmung der Wirbelsäule, die habituelle Kyphose—wir sehen hier selbstverständlich ab von den rachitischen und durch Wirbelcaries entstandenen tuberkulösen Buckelbildungen, hat man mit dem vielen Sitzen und insbesondere mit der Schreibarbeit in schlechten Schulbänken und bei schlechter Beleuchtung, welche zum Herabbeugen und Näherrücken an Lesebuch und Schreibheft zwingen, in Beziehung gebracht. Und tatsächlich nicht mit Unrecht. Von Hause aus wird niemand leugnen wollen, dass zu all den schlechten Haltungen, die Menschen acquirieren, eine gewisse Disposition vorhanden sein muss, möge nun Erblichkeit oder anderweitig entstandene constitutionelle Anlage die Hauptschuld treffen, so wird doch aus der Erfahrung heraus zugestanden werden müssen, dass unter vielen Hunderten von Kindern, doch nur eine gewisse Anzahl den schädigenden Einflüssen gleichsam unterliegt, während das Gros ungeschädigt daraus hervorgeht, weil ihre Organismen widerstandsfähig genug von Hause aus sind. Dies zugestanden, muss aber doch betont werden, dass im Schulleben hinreichend Anlässe vorhanden sind, die sich als Schädigungen gerade eben bei den Disponiertem Geltung verschaffen. Wenn also ein so empfänglich beschaffenes Kind, gezwungen ist täglich Stunden lang in vorgebeugter Haltung, noch dazu in einem schlecht gebautem Subsellium zu arbeiten, und dies Wochen und Monate lang, ja Jahre lang fortgesetzt wird, so darf es nicht Wunder nehmen wenn sich schliesslich eine habituelle Verbiegung der Wirbelsäule herausbildet, die uns als Kyphosenhaltung erscheint und das Kind unschön verändert. Dies kann und wird vielfach ohne eigentliche Verbildung der Wirbelsäule vor sich gehen und dann wohl auch reparabel sein; es kann aber doch vorkommen, dass unter dem Einfluss der stets anomalen Haltung schliesslich bei der noch beträchtlichen Plasticität der Wirbelkörper des Kindes auch durch sogenannten " Druckschwund " der Wirbelkörper, die Zwischenbandscheiben und die übrigen Bandapparate der Wirbelsäule gewisse Aenderungen erleiden, welche eine volle Wiederherstellung zur Norm hindern oder zum mindesten sehr erschweren. Auch die Muskulatur leidet ja bekanntlich unter dem anomalen Gebrauch, hypertrophirt und atrophirt ja auch unter der ihr zugemuteten Arbeitsleistung und Arbeitsentlastung.

Und das, was für die einfache kypothisch falsche Haltung gilt, gilt ja auch mit grösserem Masse, wenn die Kinder durch falsche Art der Beleuchtung, der Schreibhaltung des Heftes, der Art der Schrift und deren Richtung gezwungen wird, dauernd eine fehlerhafte Haltung anzunehmen, weil die Augenaxen nach einer fehlerhaften Richtung hingelenkt und mit diesen die gesamte Körperhaltung fehlerhaft gemacht wird. Die Theorie der Skoliosenentstehung ist bekanntlich nicht minder schwankend wie die der Myopie; die Entstehung der Skoliose ist jedenfalls kein einfacher Vorgang; aber so viel steht zum mindesten fest, dass bei der zur Skoliose führenden Torsion der Wirbelsäule, die ungleiche Belastung ebenfalls unter dem Einflusse des Druckschwundes schliesslich zu dem allerschwersten Verbildungen der Wirbelkörper und der Wirbelfortsätze führt, allmälich aber auch zur vollen Verbildung der mit den Wirbeln durch Bandapparate verbundenen Rippen; ist doch die durch Ablenkung der Augenaxen eingeleitete und geschaffene Schiefhaltung des Kopfes deren Ausgangspunkt. Der Thorax muss, wenn das Kind bei nach rechts gebogenem Kopfe Buch und Heft fixieren, dem Schreibstift im fortschreitenden Schreiben folgen soll, mit Augen und Kopf die Rechtskrümmung mitmachen und es gelangt so die Thoraxwirbelsäule in die skoliotische Torsionshaltung und Abbiegung. Dauernd geübt, lange festgehalten wird diese Torsion mit Abbiegung schliesslich mehr und mehr habituell. Das Kind verliert das Bewusstsein der Anomalie seiner Haltung und verfällt mehr und mehr in dieselbe, schon unter dem Gefühl der Bequemlichkeit und der Gewohnheit. Allmälich kommt es dann zu perversen Muskelspannungen, welche die falsche Haltung der Wirbelsäule zu fixieren vermögen und zuletzt endlich zu Misstaltungen von Bandapparaten und Knochen. Und all dieses aus den erwähnten Ursachen heraus, freilich wie schon ebenfalls betont, wohl nur bei den disponierten Kindern. Alle früher und bis in die Neuzeit ins Feld geführten Theorien, dass eine von Hause aus gegebene fehlerhafte Anlage der Ossificationskerne der Wirbel selbst, der Bandapparate und der Muskulatur allein, die Ursache der in die Erscheinung tretenden Verkrümmungen seien, müssen den Erfahrungen gegenüber zurücktreten, dass die zu Tage tretenden Anomalien immer den gleichen Charakter der habituellem Kyphose und Skoliose haben, wenn die äusseren Bedingungen immer die Analogien sind. Freilich gehört dazu, dass dieselbe lang dauernd und anhaltig zur Wirkung gelangen. Daher ist das viele langdauernde dann aber stetig wiederholte Schiefsitzen das eigentlich Schuldige im Schulleben, das zu den Anomalien führt; wissen wir doch aus den physiologischen Studien über das Sitzen überhaupt, dass schon das regelmässige Aufrechtsitzen zu Ermüdungen der Muskulatur des Stammes führen muss, weil es nicht möglich ist, ohne active Muskelarbeit aufrecht zu sitzen, wenigstens nicht in sogenannter "vorderer Sitzlage;" aber ohne active Muskelspannungen ist auch die "hintere Sitzlage" nicht möglich, und in letzter Linie führt auch diese zu fehlerhaften Ermüdungshaltungen. Möge es an diesen kurzen Hinweisungen auf die Entstehungsursachen der Skoliose genug sein.

Sie sind jedenfalls hinreichend, ins rechte Licht zu stellen, wie genau ebenso, wie für die Myopie, in derselben Richtung hin Abhilfe zu suchen sei; nämlich dass wir unsere Kinder nicht zuviel, nicht zu lange, nicht zu andauernd die Schulbank drücken lassen, sondern die Sitzarbeit auf das möglichste Mindestmass beschränken, dass wir die Schulpläne danach gestalten, die Schulpausen, die Ferienanordnungen und mit einen Worte den gesamten inneren Schulbetrieb mit Rücksicht auf die so gekennzeichneten Schädigungen der Schuljugend in möglichst guten Einklang mit den Bedürfnissen der kindlichen Organismen bringen. Gewiss ist die Schule keine Heilanstalt, sondern hat ihre eigenen Aufgaben und Pflichten, die nicht eingeschränkt werden sollen und dürfen; die Schule soll ihr Lehrziel erreichen und erfüllen und soll nicht lediglich von sanitär hygienischen Rücksichten aus eingeengt und behindert werden. Was aber gemeinsam möglich gemacht werden kann, um Schule und Sanitätswesen in ihren gemeinsamen Zielen zu fördern, das soll auch mit Verständnis und gegenseitigem Entgegenkommen geschehen.

Mit den bisherigen Erörterungen ist nun eigentlich im Wesentlichsten derjenigen Anomalien Erwähnung geschehen, die uns im Causalnexus mit dem Schulleben entgegentreten. Von allen übrigen Krankheitsformen lässt sich dies kaum, auch nicht einmal in der Theorie, geschweige aus der praktischen Erfahrung heraus behaupten, wenn anders man nicht künstlich den Causalnexus konstruiren will. Gewiss kommen, wie schon betont, allerlei andere Krankheitsformen auch bei Schulkindern in zahlreichen Fällen zum Vorschein, aber wer wollte wohl, wie das freilich gern geschehen ist, die schweren nervösen Störungen wie Hysterie, Epilepsie, Chorea, Neurasthenie, Psychosen bis zum Selbstmord, der Schule in die Schuhe schieben? Wer die vielfach auch bei Schulkindern zu beobachtenden an der Grenze zwischen Infektionskrankheit und Erkältungskrankheiten stehenden Krankheiten, wie Anginen, Laryngitiden, Brochopneumonien und genuine Pneumonien, Gelenkrheumatismus mit Chorea und obligaten Herzkrankheiten oder die Anomalien des Digestionstractus wie Diarrhöen, Dyspepsien oder gar die immer weiter sich auch in der Schuljugend sich ausbreitende Appendicitis.

Sie alle können hier nur andeutungsweise berührt und gestreift werden. Es wird schwer halten, den Nachweis zu führen, dass nicht Manches, was im Schulleben vorkommt, dazu beizutragen vermag die Affektionen in ihrer Entstehung vorzubereiten und zu befördern, die eigentliche Ursache der Erkrankungsformen wird aber weitab von der Schule zu suchen sein. Die Fälle beispielsweise von Verbreitung von Chorea in den Schulen durch Imitation haben sich der kritischen Prüfung gegenüber als nicht stichhaltig erwiesen, es handelt sich vielmehr immer um hysterische Neurosen bei von Hause aus psychopathisch veranlagten oder durch die durch Unklugheit und Suggestion überregten Kinder; so kann nun freilich auch die überhitzte Schulstube Anlass werden zur Entwickelung von Katarrhen, von Anginen und Pneumonieen, doch wie weit hergeholt ist dies! Es bedarf keiner weiteren Erörterung. Was allenfalls der Erwähnung wert wäre, ist der von vielen Seiten erwähnte sogenannte "Schulkopfschmerz" und auch das Nasenbluten der Kinder.

Beide sind ebenfalls meistens die Folge von zu langem und intensiven Stillsitzen, meist sogar in überhitzten Räumen und überfüllten Schulklassen; sie sind die Folge von Hyperämie der Meningen, ebenso, wie der Nasen- und Rachenschleimhäute und das beste Mittel die Uebel zu beseitigen ist auch hier wieder das Ausspannen für einige Zeit und die Bewegung der Kinder in freier Luft, frei von den Fesseln des Schullebens. In der Regel ist damit in wenigen Tagen dem Uebel ein Ende gemacht.

Wir wenden uns nur noch zwei Gruppen von Krankheitsformen zu, über die Manches der Erwähnung bedarf, der Scrophulose und der Tuberkulose und den eigentlichen akuten Infektionskrankheiten. Ueber die Beziehungen zwischen Scrophulose und Tuberkulose mich hier auszulassen, liegt kein eigentlicher Anlass vor; es genüge darauf hinzuweisen, dass es sich um zwei Schwesterkrankheiten handelt, von denen die eine, die Scrophulose im Stande ist der anderen, gleichsam den Boden vorzubereiten um so, dem Keim zu der anderen dem spezifischen Tuberkelbacillus die Ansiedelung zu erleichtern. Tatsächlich werden die mit der eigenartigen Constitution oder Säfteanomalie behafteten Kinder, welche wir als scrophulös veranlagt bezeichnen müssen, leicht tuberkulös, wenn sie der Infektion mit dem Tuberkulosebacillus ausgesetzt sind, zu derselben sich Gelegenheit findet.

Skrophulose und Tuberkulose der Schulkinder sind bereits lange Zeit, insbesondere aber in dem letzten Jahrzehnt, seitdem man gelernt hat, die Tuberkulose als eine frühe Kinderkrankheit zu erkennen, Gegenstand der aufmerksamsten Beobachtung. Die Tuberkulose ist, wenn man beispielsweise die preussische Statistik zu Grunde legt unter 1,000 Gestorbenen beobachtet worden, im Alter von 5–10 Jahren bei 84.9 Prozent; 10–15 Jahren bei 201.7 Prozent; also in einem sehr hohen Prozentsatz und bei meinen eigenen im Krankenhause gemachten, durch Sektionen kontrollierten also sorgsam gesichteten Beobachtungen stellt sich heraus, dass von 435 an Tuberkulose Verstorbenen im Alter von 6–8 Jahren, 42.6 Prozent; 8–10 Jahren, 28.9 Prozent; 10–12 Jahren, 14.5 Prozent; 12–14 Jahren, 34.6 Prozent standen. In meinem Handbuch der Schulhygiene habe ich bereits betont, dass die Uebertragung des Tuberkelbacillus auf die Kinder in der Schule auf die mannigfachste Weise möglich sei, wenn durch an offener Tuberkulose bereits erkrankten Schulkindern oder Lehrern Tuberkelbacillen verstreut werden. Gerade die durch das Schulsitzen geschaffene ungenügende Atmung ist am ehesten dazu im Stande, die Haftung verstreuter Tuberkelbacillen zu erleichtern und so die Krankheit bei den Schulkindern zum Ausbruch zu bringen; um so mehr dann, wenn auch sonst der Aufenthalt der Kinder im Freien beschränkt ist. Für die Tuberkuloseentwickelung ist also die Schule sicherlich wohl geeignet einen Boden zu schaffen, wenn nicht mit grosser Umsicht verfahren wird. Darum ist die so segensreiche, von mir schon vor vielen Jahren vorgeschlagene aber erst seit einigen Jahren in einzelnen Städten Deutschlands, voran in Charlottenburg, eingeführte Schule im Walde, im Freien, es sind ferner die Walderholungsstätten mit Schulunterricht, kurz alle die modernen hygienischen Massnahmen und Unternehmungen wie Ferienkolonien, Wandervereine der Schuljugend, als wesentliche Stützen zur Verhütung von Skrophulose und Tuberkulose zu begrüssen.

Was nun endlich die Infektionskrankheiten betrifft, so ist begreiflich, dass bei der Empfänglichkeit der jungen Kinder für die Infektion in dem Zusammensein der Kinder selbst eine gewisse Gefahr liegt, eine Gefahr, die uns um so deutlicher entgegentritt, als wir in der jüngsten Zeit das Augenmerk auf die an sich gesund erscheinenden, aber mit den Keimen der Krankheiten behafteten, als Ueberträger der Infektionskrankheiten gerichtet sehen. Der Einschleppung von Infektionskrankheiten in die Schulen kann unter solchen Verhältnissen nur mit der grössten Vorsicht gesteuert werden und man kann nur billigen, dass Prohibitivmassregeln in den verschiedenen Ländern, besonders ja auch in Amerika geschaffen sind, um die Einschleppung zu verhüten. Freilich wird dies nur immer bis zu einem gewissen Grade gelingen, einmal, weil die Incubationszeit einzelner Krankheiten, wie der Masern, die Infektion bereits wohl, aber die Diagnose der Kinderkrankheit noch nicht gestattet.

Sodann aber auch deshalb, weil es wie beispielsweise für Scharlach kaum eine Grenze der Infektionsfähigkeit gibt, da man völlig vom Scharlach wieder hergestellte Kranke noch nach vielen Wochen die Krankheit verbreiten sieht, ohne dass man im Stande wäre zu sagen, auf welchem Wege die Verbreitung vor sich geht. Freilich kann man, wie beispielsweise bei Dipththerie oder Typhus die Dauerträger von Bacillen füglich nicht ein für alle Mal vom Schulunterricht ausschliessen. So wird immerhin eine gewisse Gefahr der Verbreitung der Infektionskrankheiten durch die Schulen bestehen bleiben, gegen welche man sich freilich durch grosse Sorgsamkeit in der Beobachtung und Untersuchung der Schulkinder. und der ausbrechenden Epidemien gelegentlich durch völligen Schluss der inficierten Schulen wird einigermassen zu schützen vermögen. Begreiflicherweise bedarf es hierzu gut vorgebildeter Männer, der Schulärzte und Schulinspektoren, welchen die Ueberwachung der Schulen anvertraut ist. In Deutschland sind wenigstens für die Volksschulen derartige Funktionäre seit meinen bereits im Jahre 1876 in meinen Handbuch der Schulhygiene gemachten Vorschlägen eingeführt. Im Ganzen wird aber auf der anderen Seite auch die Schule durch die Belehrung über Reinhaltung und Händewaschen und Desinfection an Kindern und Eltern dazu beizutragen vermögen, Epidemieherde einzuschränken, und Epidemien zu löschen.

Meine Damen und Herren: Am Schlusse meiner Ausführungen bin ich mir bewusst nur in ganz flüchtiger Weise das grosse und umfassende Thema, das mir gegeben war, zur Erörterung gebracht zu haben. Wollte ich in die Details der Dinge gehen, so wäre ich Gefahr gelaufen, den zweiten Teil meines Handbuchs für Schulhygiene nochmals zu schreiben, weil dieser im Wesentlichen sich mit all den hier einschlägigen Krankheitsformen "during the school life" befasst. Sollten Sie also mehr Belehrung suchen, als ich in der Lage war in kurzem Abriss Ihnen hier zu geben, so bleibt mir kaum eine andere Wahl als Sie auf dieses Buch, oder auf ähnliche Werke über Schulhygiene zu verweisen.

SCHLUSSSÄTZE.

1. Wenn man gleich nicht von "Schulkrankheiten" in dem Sinne sprechen kann, wie man von "Berufskrankheiten" spricht, so muss doch zugegeben werden, dass unter dem Einfluss des Schullebens bei Kindern eine Reihe von Krankheiten vorkommt, die beobachtenswert sind.

2. Es giebt einen Symptomencomplex, welcher als "Uebermüdung" oder "Ueberarbeitung (overwork)" bezeichnet werden muss und unter dem Einfluss der Schulleistungen entsteht, und es ist nicht richtig Alles, was in diesem Symptomencomplex zur Beobachtung gelangt, lediglich auf congenitale oder anderweitig erworbene Neurasthenie oder Psychopathie der Kinder zurückführen zu wollen.

3. Die Myopie, welche sich im Schulleben der Kinder entwickelt, ist keine bösartige (maligne) Form der Augenanomalie, sie ist aber doch recht beachtenswert und kann durch gute Schuleinrichtungen, wie auch durch gute Gestaltung des Schulunterrichts auf einen geringen Grad des Vorkommens, reduciert werden.

4. Die Wirbelsäulenverkrümmungen, welche sich im Schulalter entwickeln, sind lediglich die Folge zu vieler Sitzarbeit und insbesondere der zu ausgedehnten Schreibarbeit der Kinder. Die Verbesserung der Methoden des Unterrichts und der Schulpläne kann dazu beitragen die Erkrankung aufzuhalten.

5. Es ist ungerechtfertigt eine grosse Anzahl von Krankheiten, die sonst im kindlichen Alter zur Beobachtung kommen, mit dem Schulleben in Beziehung zu bringen.

6. Gegen die Infektionskrankheiten, auch gegen Tuberkulose, vermag eine sorgsame hygienische Ueberwachung der Schule durch Schulärzte und hygienisch ausgebildete Schulinspektoren einen relativen Schutz zu schaffen; notwendig hierzu ist überdies die Verbreitung hygienischer Kenntnisse im Volke selbst.

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[1] Baginsky: Die Schule im Dienst der öffentlichen Gesundheitspflege. Vortrag d. 24. Oktober 1905 in Berlin Verein für Schulgesundheitspflege. Druck von L. Schumacher.

MENTAL HYGIENE IN THE SCHOOL.

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During the last 25 years the hygienic conditions of almost every industrial occupation have been studied. It is not strange, perhaps, but rather in accordance with the natural evolution of science, that the occupation of the brain worker, especially in the public schools, should be among the last to receive such special investigation. It was only a little more than 20 years ago at the London Congress of Hygiene and Demography, 1891, that Burgerstein reported his classic investigation on the curve of work for a school period of one hour. And it was only four years ago that the first book (Huey's) on the psychology, pedagogy, and hygiene of reading was published.

The importance of the subject, however, which is suggested by the fact that in this country alone some 18,000,000 of children are engaged in school occupations during a large part of the year, has been recognized, and many scientific studies relating to it have recently been made.

We are coming to see that the mental condition, or mental environment—a subtle but definite thing we attempt to describe by such words as mood, temperament, emotional type, mental attitude, sthenic index, Einstellung—is quite as important for the health and efficiency of the individual as the external environment. This mental environment, as we have called it, conditions not only the nervous and mental activity, but also, in an important way, digestion, secretion, and the trophic functions in general. Both directly and indirectly it affects the mental health. All this, however, is vague and indefinite. It suggests, perhaps, all sorts of fads and vagaries; and, in the minds of many people, the whole subject of mental hygiene means merely a mixture of whims, superstitions, mystical formulæ, and occult processes. Modern studies of the brain and mind, however, have yielded results that have at least formed a solid foundation for a scientific mental hygiene.

The chief results have come from four sources: (1) The physiological studies of the conditions of intellectual activity and feeling—a long series of investigations from Mosso's early work on the cerebral conditions of mental activity, to the recent studies by Cannon and others of the correlation of adrenal secretion and feeling; (2) recent studies in psychiatry; (3) recent experimental studies in psychology and pedagogy; and (4) recent genetic studies, of physiological and psychological age, and the like, among school children and defectives. On these results, which there is not time to mention here, a new application of hygiene, the hygiene of instruction, has developed.

Mental hygiene has clearly stated the problem of the hygiene of instruction, and it challenges every subject of instruction, every method and device, and even every pedagogical principle. It emphasizes the fact that, besides the direct pedagogical results of the study of any subject, there are also certain secondary results, and it notes the significance of these for health. Many examples of such secondary results might be cited; habits, attitudes, neuroses, arrests, important both for efficiency and health.

Efficiency in mental activity at any given time depends upon many conditions both physiological and psychological. Among the former, are physiological age, the blood supply to the brain, as determined by the general nutrition; the size of the cerebral arteries, exercise, posture, etc.; the quality of the blood, as determined by food, drugs, oxygen supply, etc.; the condition of the tissues and metabolism, as determined by the environment, temperature, humidity, barometric pressure, light, peripheral stimulation, etc. Among the latter the psychological conditions are the feeling tone, as determined by the condition of the nerve centers, internal secretions, etc.; habits of work, of sleep, of attention, interest and association, and self-control, reaction to feeling, etc.

To attempt to determine the conditions of healthful mental activity is an exceedingly complex problem; but here psychology comes to our aid and, while noting the extreme complexity of the psychic processes in the active, thinking individual, it shows certain unifying laws and suggests the fundamental principles of a sound mental hygiene. Some of these may be formulated tentatively, and in the briefest and most general way, as follows:

1. Perhaps the most primitive and fundamental mental function is attention. It has aptly been compared to the tropisms in plants and animals. While structurally it means clearness, genetically and functionally it means a reaction of the organism comparable to the tropisms. The most primitive and natural form of attention is a reaction to certain immediate stimuli, to the present situation. The type of healthful attention everywhere is attention to the present situation. The ability to concentrate on the present, forgetting the past, except so far as vitally related to the present and ignoring the future except as it forms a part of the present is so important for the mental health that the degree in which one can concentrate upon the present is a test of mental health and sanity.

In case of children, especially, the normal mental attitude is that of attention to the present situation. We all know how quickly the emotions of childhood pass, how brief are the child's sorrows, how few its anxieties, unless there is some abnormal training or chronic pathological neurosis. In other words, the carelessness of children that we complain of is usually one of the marks of sanity. Clouston, in his "Neuroses of development," notes the reverse of this as one of the symptoms which may lead one to anticipate adolescent insanity.

2. The second fundamental thing in psychology is the law of association, a law in the mental world comparable, as pointed out by Zanotti and Hume, to the law of gravitation in the physical world. The corresponding principle of mental hygiene is the need of orderly association in our thinking for the integrity of the mental health. Conversely, perhaps the most general term for whatever menaces the mental health is, in psychological words, interference of association. What is meant might be illustrated by innumerable experiences of everyday life.

Many people are never straightforward and orderly in their processes of thought. They are always thinking of two things at once; or, if one subject holds the focus of attention, other things are in the background or indirect field of consciousness, and liable always to interfere and cause distraction.

All of us at times experience this: Waiting for an important engagement, a forgotten duty, uncertainty about a verdict, unfaithfulness to an ideal, and the like, are occasions for it; and every individual in the stress of circumstance, from the collapsing financier to the rattled baseball player, furnishes illustration.

Many laboratory experiments, especially those on the acquisition of skill, and those by the so-called Diagnostische Assoziationsmethode, give noteworthy examples.

In normal subjects, the association reaction time is usually pretty uniform; only occasionally is there a disturbance which causes a lengthening of the time. In case of abnormal subjects, the response is frequently delayed so that the curves representing the association reaction times are irregular. Again, it is found that in normal persons, in the case of emotional disturbances, the association reaction time is likely to be lengthened. If a person has committed a theft, associations connected with that show an abnormal reaction time. Again, in cases of hysterical disorder caused perhaps by psychic shock, or the like, associations connected with the disturbing complex of ideas show a greatly lengthened reaction time. Especially significant is the fact that associations connected with one's own family, wherever any unnatural or abnormal conditions exist, are likely to show lengthened time. From perhaps a normal reaction time of one or two seconds, sometimes the time is lengthened to four, or six, or ten, or more seconds.

The great waste that results from such interference of association is shown first by this great loss of time. In all cases where the reaction is thus retarded by feeling, we have pretty clearly interference of association. And, on the other hand, interference of association is pretty sure to be correlated with feeling.

The extreme form of interference of association and worry is well illustrated by the so-called obsessions. These are in great variety, from obsessions in regard to one's physical health or one's soul's salvation, to the slight temporary obsessions where a nonsense rhyme or an absurd image persists in consciousness. They may refer to the past or to the future, and, whatever their content, they seem to be abnormal. Apparently, if one gets into the habit of such obsessions, whether from ill health or bad training, the victim is bound to have them in some form or another. Thus we often notice persons who must always have something to worry about. If it is not one thing, it is something else.

Wherever such interference of association occurs, especially if, as is usually the case, feeling is also present, we have an incipient form of worry, and this, in any form, is injurious to the mental health. Hence, in all methods of teaching, and in the whole hygiene of instruction, care must be taken to avoid confusion or interference of association.

That orderly association is a matter of temperament, nervous condition, and training is shown by the fact that it is not dependent on the external environment, but rather on what may be called the mental situation or mental environment. The modern man often works with concentration and without interference of association under apparently most distracting circumstances, and what is distracting to one individual is not necessarily so to another. I know a man, for example, who often can do his best work, working naturally and without interference of association, while riding in the steam cars, or listening to the clicking of a telegraph instrument, or at a vaudeville performance; in fact, almost anywhere, in spite of what would seem distracting sights and sounds, provided he feels no responsibility in regard to them. But this same individual, being imperfectly trained, is often the victim of interference of association while working in his own office, because of the feeling of responsibility for many duties.

Interference of association is not likely to occur in a child's spontaneous mental activity. It is only when we attempt to develop the so-called power of voluntary attention, which is really imperfect attention, that interference occurs. Under present conditions, with the lock step of the drill squad, with the wasted years of the retarded children, the pupils are sure to leave the schools with bad habits of attention and disorderly association. The schools might give a training that would prepare for the activities of life by developing healthful habits.

3. The third great principle of mental hygiene is that of normal reaction to feeling and emotion. The tremendous importance of the emotional life to the mental health has now been recognized; but

only recently have the subtle, far-reaching effects of abnormal repression of feeling been shown. Repression of an emotional impulse to react disorganizes, disintegrates, and demoralizes. The repressed emotion must find an outlet in some way. All sorts of bizarre and abnormal expressions of feeling are reported by scientific observers in psychiatry.

Now, there are two general forms of reaction to feeling, the obvious natural physical reaction, on the one hand, and a secondary associated psychic reaction on the other. Within certain limits, both are natural and normal, as is made clear by many examples. For example, if my neighbor insults me without provocation, a natural form of reaction may be to knock him down; or I may philosophize about it, and disdain to resort to violence; and this mental reaction may be just as normal as the physical expression of feeling. Thus the man who has many interests and many mental attitudes, as we may call them, that of the philosopher, the humorist, the psychologist, the philanthropist, and the like, has so many possible means of self-control and of normal reaction to feeling.

The work of education, culture, and morals, is largely to train to these habits of secondary associated reaction on occasion of emotionally exciting situations. In all the social experiences of the school, large opportunity occurs for developing habits both of health and of morals.

4. The fourth fundamental principle of mental hygiene is the proper alternation of periods of work and of rest. According to some hygienists, this is the most important principle of nervous and mental hygiene, and both the work and the rest are essential conditions of health. We are not lacking for a solution of our problem by reducing our mental activity, or by making it less intense, or by cutting down the expenditure of energy. Function, work, the explosion of energy, seem to be the condition of health everywhere. Work is a condition essential to rest as well as rest is a condition of work. Here should be considered the results of 25 years of investigation of fatigue; and recent studies of efficiency in the industrial world have shown this need of a proper alternation of work and rest; the principles of so-called scientific management are substantially the principles enunciated by scientific physiology and psychology 20 years ago; but the ordinary man is more ready to accept these principles, when stated in terms of pig iron lifted, than when applied to the operations of the counting room or the study. Alternation of work and rest is absolutely essential for both health and efficiency; but the most important applications of this principle are probably seen in the ebb and flow of normal attention when one works naturally and spontaneously in a subject in which one is

interested, and in the proper balance between an individual's strength and the demands of one's environment.

There is not time to speak in detail of the errors of the school in regard to mental hygiene—methods that produce erroneous associations, the undue haste in requiring quick answers when a child's association reaction time is several seconds longer than that of the adult, the methods of repression that lead to inhibition of the will, and the like—but perhaps the one most serious fault of the school may be put in a general way by saying that it is apt to give work prematurely, or by a wrong method, and to discourage and depress, when both hygiene and pedagogy demand success, confidence, and cheerfulness.

A false pedagogy, built up on a superficial and obscure, but now largely obsolete psychology, is to blame for many unwise practices in the schools. We have exalted the value of doing disagreeable things in education, of exercising the so-called voluntary but really imperfect attention, of doing important things at as early an age as possible, or remedying nature's defects by an all-around symmetrical training, and, in general, the advantage of doing what children do not like and are not well fitted to do. How common this practice is everybody knows. An account of what would seem to be the earliest historic attempt at this method of training will be sufficient for illustration. I quote the report of Prof. Dolbear:

> In antediluvian times, while the animal kingdom was being differentiated into swimmers, climbers, runners, and fliers, there was a school for the development of the animals.
>
> The theory of the school was that the best animals should be able to do one thing as well as another.
>
> If there was in a given animal an apparent aptitude for doing one thing and an apparent inaptitude for doing other things, the time and effort should be spent upon the latter rather than on the former.
>
> If an animal had short legs and good wings, attention should be devoted to running, so as to even up the qualities as far as possible.
>
> So the duck was kept waddling instead of swimming. The pelican was kept wagging his short wings in the attempt to fly. The eagle was made to run, and allowed to fly only for recreation; while maturing tadpoles were unmercifully guyed for being neither one thing nor another.
>
> All this in the name of education. Nature was not to be trusted, for individuals should be symmetrically developed and similar, for their own welfare as well as for the welfare of the community.
>
> The animals that would not submit to such training, but persisted in developing the best gifts they had, were dishonored and humiliated in many ways. They were stigmatized as being narrowminded and specialists, and special difficulties were placed in their way when they attempted to ignore the theory of education recognized in the school.
>
> No one was allowed to graduate from the school unless he could climb, swim, run, and fly at certain prescribed rates; so it happened that the time wasted by the duck in the attempt to run had so hindered him from swimming that his swimming muscles had atrophied and he was hardly able to swim at all,

> and in addition he had been scolded, punished, and illtreated in many ways so as to make his life a burden. He left school humiliated. and the ornithorhynchus could beat him both running and swimming. Indeed, the latter was awarded a prize in two departments.
>
> The eagle could make no headway in climbing to the top of a tree, and although he showed he could get there just the same, the performance was counted a demerit, since it had not been done in the prescribed way.
>
> An abnormal eel with large pectoral fins proved he could run, swim, climb trees, and fly a little. He was made valedictorian.

Ever since that day the opinion has grown that the school must reform children.

By all means let us reform children if we know how; but, in order to do so hygienically and morally, we must study the individual—physiological and psychological age, capabilities, habits, attitudes, and affective conditions of euphoria, dysphoria, and the like. Where we lack knowledge it is well to let the matter alone. The importance of working spontaneously and with joy and success is emphasized by experimental studies of the learning process.

Dr. Book, for example, in the laboratory of experimental psychology at Clark University, studied the development of skill in the use of the typewriter. On the basis of this research he reports as follows:

> It is not what the learner would like to do, but what his mental and physical condition at the time of study or practice will let him do, that is important for determining his progress. The most economic learning would seem to demand that the learner work only when he can enjoy it and succeed—and to wait until he can.

Let no one make the mistake of supposing that the aim of school hygiene is to make school work easy. On the contrary the aim is so to improve conditions that it can be made hard and that the pleasure that comes from intense and successful effort may be possible.

Such are some of the fundamental principles on which a sound hygiene of instruction must be based. The subject in its practical applications, however, can be built up only by careful experimental studies by many investigators, but the subject already has a definite basis, a definite aim, a set of definite problems, and is now devising methods of investigation. The results already obtained are not spectacular, but they are important. They can not be presented without enumerating a mass of details, most of which have been condensed by Burgerstein into some 400 pages in the second edition of his Handbuch. But the great result is the new attitude toward the work of school instruction, an hygienic apperception, if you please, which does not ignore the secondary results of instruction and regards all educational processes from the hygienic point of view.

No one who reflects upon the fact that the patients in our hospitals and sanitariums were a few years ago pupils in the public schools, and on the further fact that in the schools, from four to six hours a day, five days in the week, for the period from six to fourteen or later, the children are engaged in brain work, in forming habits of attention or inattention, orderly or disorderly association, and developing interests healthful or unhealthful, can fail to see the significance of all this for hygiene. In fact, the very aim of the school is to develop certain permanent interests. If the school is successful in this, it means the acquisition of certain permanent habits of orderly association, but, unfortunately, it often sadly fails in this.

In the latter half of the last century a vast deal was written by physicians about overpressure and injury to health in the schools. A good deal of overpressure still exists in some places, but it is not my purpose now to lay stress on this. The charge against the school by the modern hygiene of instruction is not so much that the school directly injures the health of the children, but rather that it neglects the opportunity to foster health. Healthful habits of mental activity are not developed, and the pupils have to be reeducated in the reformatory, the hospital, and the sanitarium.

Parents and teachers alike are dissatisfied with the work of the school. They are wont to think lightly of what is gained in the way of conventional knowledge, but habits of mental health and efficiency, such as have been described, would be of inestimable value. Thus it is not without reason that students of education are beginning to demand a thorough reorganization of our schools on the basis of somatic and mental hygiene and genetic and experimental pedagogy.

STUDIES IN THE RELATION OF PHYSICAL INABILITY AND MENTAL DEFICIENCY TO THE BODY SOCIAL.

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Emerson once said that "Nothing great was ever achieved without enthusiasm" and perhaps we have here the crux of our problem for the care and training of the mental defective. Certainly, up to within a very short time ago there was no very definite or marked enthusiasm over either the physical or mental qualifications of the ament. The less said about this class of society the better pleased people seemed to be, and, as for our lawmakers and those whose duty it was to make adequate provision for these unfortunates and protect them by the much vaunted "strong arm of the law," they have time and again turned a deaf ear to any plea which was made in their behalf, and we are now reaping in a large harvest of shame and crime as a just reward for the general ignorance and neglect of them.

I have chosen, somewhat at random, a group of 10,000 cases which have been presented to me for medical examination, to determine their physical and mental fitness for the work required of them in the school grades. In every instance the child had fallen behind others of his or her age and grade and had continued to retrogress for some terms. In every instance I found positive physical defects, and, with many, combination of physical unfitness with a serious mental defect, which demanded a proper segregation of the case in question. Ofttimes the improvable cases had become discouraged because of the ever constant inability to cope with the tasks set by the curriculum, discouragement when the little brother or sister, perhaps years younger than our weakling, was able to reach the same grade with our defective and in a term pass ahead to a higher grade, receiving the praise of parents and teachers, while our unfortunate received the odium and berating which he should never have been called upon to bear. To-day the outlook for such a child is a little more favorable, for the sleepiest teachers now have had borne in upon them the fact that there are children who are wholly incapable of doing grade work, and that very many are unable to do even the manual work.

Ten thousand cases! Ten thousand little human beings so seriously handicapped that they will never be able to enter fully into competition in order to earn a livelihood—so seriously handicapped that the major number should be segregated, and marriage and procreation be absolutely denied them.

The greater number of the physical defects could be very much bettered—many of them cured—but the mental unfitness is irreparable. Up to a certain point, all of these cases could be trained to become useful units in a colony life, suited to their individual needs and under proper supervision; but if left to drift, after their brief term of school life ends, will in large measure become derelicts, and will, in time, fill our penal institutions and our homes for fallen women; or worse, live at large and procreate their kind in large numbers.

Not a single low-grade case of imbecility or idiocy has been included in the number of cases presented; all would fall within the limits of middle grade and morons.

All of the low-grade cases of iodiocy, imbecility, and Mongolianism should, without any question, be placed where they may be protected from society and from themselves; but the number is so great in the city and State of New York that adequate provision is, at present, and for some years to come, entirely out of the question.

I made an attempt to get at the facts of the housing problem in the State a few weeks ago. We have a number of good, well-equipped institutions located at Rome, Syracuse, Newark, and a fine new colony under construction at Thiells, known as the Letchworth Village, having something over 2,000 acres of the finest farming land, orchards, gardens, and the like, in the beautiful and fertile valley of the Hudson River. This was set aside by the State two or three years ago. We have also one of the best-known colonies for epileptics—the Craig Colony, at Sonyea. Yet in every instance, in answer to my query: "Have you a waiting list?" the reply was: "Yes, * * * anywhere from 400 to 850," whose names are listed and who have no chance of entering unless death claims some of the present inmates or we have new buildings and increased facilities. We have a sufficient number of mental derelicts in our New York City schools to practically refill these State institutions at this minute, and the end is not yet, and one wonders what the outcome is to be. Our daily press tells us that "on an average one murder a day is committed in our city," and I am convinced that this number will be increased within the next few years unless we are able to secure some pointed and drastic legislation which will enable us to care for the cases we now know to be feeble-minded.

This past summer has been one of the most appalling tragedy; innocent little girls, who were mentally bright, have been decoyed from their homes, and then made the victims of the most horrible assaults and left to die in a manner which makes the blood in one's veins congeal. Several cases of this character have been recorded—the most awful was perhaps that of little Julia Connors, of the Borough of Bronx—fiendishly assaulted, her body horribly mutilated; she was then left to die, by a lad in his teens, who had been serving a term because of another and similar assault on another little girl, a lad known to be of defective mentality, who was, at this time, out on parole because he had been able to deceive his keepers. This poor creature was afterwards found dead—by his own act.

There are very many such lads, in their teens, in our midst, who are merely biding their time, merely waiting for the match of uncontrolled and uncontrollable excitement to start their brains of straw into a burning flame, and then our people will shake their heads and bemoan the existence "of such creatures."

In the recent scandal over the Rosenthal murder, many of the hirelings implicated in aiding and abetting the act are, without doubt, human firebrands—mental derelicts. Our prisons, our jails, our homes for fallen women, our truant schools and reform schools, all house the mentally unfit. Sometime ago, Dr. Fernald pointed to the fact that "feeble-minded women are sources of debauchery and licentiousness which polute the lives of boys and youth of a community, disseminate disease, and bring young children into the world destined to repeat their history". We have one classic record of the descendants of one defective couple in the State of New York, known as "the Jukes family," whose descendants, traced through five generations, numbered 1,200, 709 of whom lived, the majority being vagabonds, paupers, criminals, and prostitutes. This one family is known to have cost the State of New York over a million and a quarter dollars in 75 years. Could we compute the monetary cost to our State of the hordes of families, living quite as notorious lives as did the Jukes descendants, the result would be more startling than was the shock of the *Titanic* disaster, and quite as inexcusable and unnecessary.

Almost all the physical defects to which children fall heir were found in the course of my examination; as a rule, one child presented several defects; those producing a condition of malnutrition were greater in number than others.

The condition of the children's mouths was in almost every instance deplorable. Only once, in a large number of cases (71.4 per cent) did one find good teeth; as a rule they were very badly decayed; in some instances extractions had been made, leaving the small jaw practically in a senile condition, as the permanent teeth had been removed and the child had nothing of account left with which to masticate. Hundreds of other cases had teeth in a very active state of decay, which could produce naught but poor digestion and, in turn, malnutrition.

Several thousand cases (77.5 per cent) showed marked tonsillar enlargement, with adenoids, producing improper oxygenation of the blood, high-arched palate, and a general lowered vitality of the whole body. More than three-quarters of the number of children presented some form of ocular trouble, ranging from a simple remedial strabismus to tuberculosis and tumor of the eyeball. About half of the number presented impaired hearing. Nearly one-third showed heart lesions, some of a very serious type. That giving the largest percentage was mitral-regurgitation—in a very large number without compensation. Tachycardia was a very common symptom among these children of defective mental caliber. The usual variation from the normal in children whose hearts should presumably have reached the normal adult thythm was 135 to 145; many cases, however, exceeded this count, some running up to 165 and a trifle more. Naturally, where "rapid-fire drills" occur at any time, these children present a serious menace to the entire school for, though our schools have been particularly free from serious fires, one never knows when the drill may be because of necessity, rather than as a matter of routine training. I have known of instances where a small child suffering from tachycardia has been picked up and carried down the stairs by the teacher in order to avert a scene, and perhaps a panic. This condition which I have found so frequently should serve as a warning, as well as a positive proof, that all classrooms for children who are mentally defective should be on the main floor; such children should never be permitted to go above the first flight.

I might here interpose a plea to other medical men and women whose duty it is to examine large numbers of school children that they make as careful examination of the child's heart as is possible. Frequently their care will reveal much which may prove of inestimable value in the treatment and proper school care of the young one. Chorea and epilepsy have an appreciable showing, though not so large—possibly 1,000 cases in all having one or the other—as one might suppose. This fact has been a surprise to me, as I had always thought the proportion larger.

Speech anomalies were very numerous; fully 42 per cent of the children were suffering from defects of this sort. Many of the cases were of purely neurotic origin and were remedial, still others were improvable, while some were of such a nature that little or nothing could be done for them. Stuttering, stammering, and lisping were among the most prominent defects. The high-arched palate of many of the children was a cause of defect hard to remedy, as the tip of the tongue has no chance to approximate its proper functioning, while cleft-palate, mostly nonoperative, caused other nonremedial defects. There was also an appreciable number of children who had never spoken, but whose hearing seemed unimpaired. As fast as it is possible to care for this class of cases they are being segregated into what is termed "speech classes for hearing mutes."

Naturally, the neurotic cases were numerous. About one-third of the total number showed marked instability of the nervous system, while more than half presented sexual disturbances. Many masturbators came under this heading. A goodly number showed the sequelæ of such diseases as spinal meningitis and infantile paralysis, and many a sorrowful mother has been able to give a good history of her child up to the onset of one or the other of these dread maladies. The seeming results of alcoholism in the parents have been especially noted among the children of longshoremen, truckmen, and those parents whose occupations expose them to the rigors of our climatic changes. Along our lower West Side and in that section of our city euphoniously known as Hell's Kitchen. I found the greatest number of children presumably suffering from this heredity. If the teachers' statements are of any worth, these children are reported as being extremely neurotic and inflammable and show more really ugly characteristics than any other children thought to be defective.

Perhaps one of the most interesting phases of my work has been the attempt to tabulate the nations represented by the children sent up to me for these special examinations. It is only in the natural sequence of the manner of growth of our population that a very large percentage of the cases of mental defect should be found among our alien population, for in such a cosmopolitan city as New York nearly all nations send representatives—one might say misrepresentatives, for, surely, no mental derelict can truly be said to represent his or her native land. Up to the present—and, at this time, one can not tell what changes may occur—the two nations which may be said to lead all others are Russia and Italy. For a long time Russia was first on the list, but now Italy has come up to her and has even surpassed her by a fraction of 1 per cent. The German Empire and Austria have contributed no small number, while Britain sends her quota, Ireland leading, followed by England and Scotland; Wales has not contributed any subject for my study. The other countries contributing their quota have been Poland, Scandinavia, France, Bohemia, Roumania, Spain, Turkey, Switzerland, Syria, Greece, Arabia, Canada, West Indies, and, of the South American countries, Brazil.

These studies of our urban population are in no way complete, nor can they become so for a very long time, because of the inadequacy of the number employed in making these investigations. The need for more physicians who are specializing in this particular field of research is great, and their work should be augmented by that of an earnest, intelligent corps of social workers, whose time would be entirely devoted to the ferreting out of the kind of statistics which will prove of paramount value.

The hygienic relation of persons of such lowered physical and mental stamina to the body social, it seems to me, is so apparent as to make a summing up practically unnecessary. Surely no one in this audience needs to be prodded to do his duty in seeking the proper housing, proper segregation, and right and just laws for the unfortunate class of individuals we have had under consideration.

What we need in the United States of America is a realizing sense by our thinking people of the enormity of the problem which confronts us. Our immigration problem is tremendous. Gladly do we welcome the poor and the downtrodden of other nations, but we must be firm in our exclusion of the mentally unfit. Our work here must go on, not only at our ports of entry, but at the points of embarking, and the steamship companies must be held responsible for their unprincipled part in the bringing over, under much hardship, of so many cases of mental and physical unfitness.

Without a doubt we will always have the " ament " and the physical defective with us, for so long as we disobey the laws of hygiene and of health we must expect at least a part of the punishment meted out on the innocent offspring. It is largely dependent on those of us who are alive to the immenseness of the problem and who are in vital touch with it to make our voices heard whenever and wherever we find opportunity to do so. We must even make these opportunities, and we must have our lawmakers become familiar with the class of cases herein described. They must be made cognizant of the conditions producing such defectives, and then made intelligent as to the direful consequences of legalizing the propagation of the unfit.

The task is stupendous, but if all interested will loyally pull together for the common good of humanity I am hopeful that we may accomplish much. "Nothing great was ever achieved without enthusiasm."

Percental chart of 10,000 cases showing relative physical defects.

Chorea	4.0
Epilepsy	5.1
Heart	29.9
Nose	34.9
Throat	42.6
Neurotic	37.0
Sex	41.5
Speech	42.0
Ears	48.3
Dental	71.4
Indicating general medical care	74.3
Eyes	95.3
Needing residential hospital care	6.9
Needing special open-air school	3.5

Percental chart of 10,000 cases children born in foreign countries.

Italy	15.3
Russia	15.1
Germany	7.7
Austria	3.5
Ireland	3.3
England	.9
Roumania	.8
Scandinavia	.7
Polish Jews	.5
Bohemia	.5
France	.1
Scotland	.1
Greece	.07
West Indies	.07
Turkey	.07
Spain	.06
Syria	.06
Canada	.04
Switzerland	.03
Holland	.03
Brazil	.03
Cuba	.01
Arabia	.01
Unknown or mixed parentage	8.3

Percental chart of 10,000 cases children born in United States.

Russian parentage	20.5
Italian parentage	18.9
German parentage	13.9
Irish parentage	7.1
Austro-Hungarian parentage	5.8
English parentage	1.9
Scandinavian parentage	1.4
Roumanian parentage	1.1
Bohemian parentage	1.0
Polish parentage	.7
Scotch parentage	.3
French parentage	.2
Spanish parentage	.1
Swiss parentage	.1
West Indian parentage	.1
Turkish parentage	.07
Dutch parentage	.07
Greek parentage	.07
Syrian parentage	.07
Brazilian parentage	.04
Cuban parentage	.04
Arabian parentage	.01
American (whites and negroes)	17.3

25.42 per cent of all cases were of foreign extraction; 48.05 per cent of all cases were American born of mixed foreign parentage.

Of these 21.8 per cent were Russo-Polish Jews, 19.6 per cent were Austro-German Jews, and 58.6 per cent were various mixtures.

17.3 per cent of all cases were of native birth and parents; 82.7 per cent of all cases were of foreign birth or parents.

DISCUSSION.

Dr. Maximilian P. E. Groszmann, Plainfield, N. J.: It has been claimed that at present there are no funds available to take proper care of the mentally defective children in custodial institutions. This is a fallacy, as we are now spending much more in the wrong way for these children than would be necessary if we took hold of them in the right way and at the right time. Consider that we spend from three to four times as much for each "defective" child in a special class as the per capita cost of the "average" pupil. And then, this money is wasted, inasmuch as the defective will remain a burden to society after passing through this special education. Add to this the expenses of the reform school, industrial school, truant schools, and other institutions in which such children will eventually land, and you have a second idea of cost. Again, add the cost of almshouses for the derelicts, and the expense of police courts, and the so-called administration of justice in general, which is necessitated by these children growing up and remaining at large; add, further, the enormous sums given to so-called charity which again go to the inefficient, the failures, the derelicts, and you will count the amounts thus futilely expended by the many hundreds of thousands. And this spending does not mean an investment, as these derelicts constitute no possible social asset at any time. Think of the expense caused to New York County by the one "famous" trial of Harry Thaw. Such cases are legion. If we consider all this we shall understand how we are misspending vast sums, and that by taking care of these hopeless classes of children at the right time, and in the right manner, we would really save and economize. We must open the eyes of the public to what would constitute a sane educational investment.

THE SIGNIFICANCE OF PHYSIOLOGICAL AGE IN EDUCATION.

C. Ward Crampton, M. D., Director of Physical Training, Department of Education, New York City.

We are beginning a complete readjustment in our methods of caring for the child in medical, social, and scholastic ways, and we have consciously begun this revolution by assuming a critical attitude toward our general practice of classifying all children on a basis of chronological age—the number of years which they have lived. The readjustment, when complete, will provide a new basis for record, investigation, and treatment of all kinds, and this basis will be the physiological or psychological age.

The doctrine of physiological age affirms the fact that mental and physical development of children, adolescents, and adults, proceeds through easily recognizable and discrete stages, and maintains that all classification and grouping of the growing and developing human being should take cognizance of, and relate themselves primarily to, these stages; and, secondarily, and in a decidedly minor way, to the artificial groupings upon the basis of the school grade or chronological age.

This doctrine is based upon a careful but as yet incomplete survey of developmental stages, and a search for easily recognizable signs which accompany each stage. The developmental signs may be anatomical, such as the appearance of the six-year molar, the wisdom tooth, or pubic hair; physiological, such as menstruation, change of voice, menopause; or psychological, such as change of rote to associative memory, the wane of the collecting tendency, the budding of the earning instinct; and, later, the characteristic rumination of senescence. In short, we have sought to ascertain by extended and intensive investigation what the significant stages of change may be, and to discover easily recognizable signs whereby we may, from observation, denominate a child or adult to be in this or that stage, so that we might place him in classes of individuals of the same stage of development, for the purpose of adjusting and standardizing our medical, scholastic, and social treatment to natural instead of artificial requirements.

DEVELOPMENTAL PERIODS.

Intra-uterine growth is extremely rapid; after birth, it is followed by a rapidly decreasing rate of growth and development, until, at the age of 2 or 3, the child begins to grow at a slowly increasing rate, until a plateau of almost no growth and development is reached at about the chronological age of 7 or 8. The static condition is maintained until there has commenced the great pubertal age. At this time, the most important epoch of adult life, second only in significance to the event of birth, the child commences a period which can only be likened to an explosion of growth and development. He begins to grow tall with great rapidity; weight is added pound by pound, and, with the increased bulk, comes a rapid addition to the muscle, strength, and motor ability. This age is most prone to begin during the warm months of the summer, and when it does occur, a single month may add an inch in height, 20 pounds in weight, and double the muscle force. After a variable length of time, a year, or a year and a half, the increase in height, weight, and strength gradually return to a slower rate, and the body and mind proceed with a stage of ripening which we call adolescence. The following normal boy illustrates a rapid change from prepubescence (noted as stage 1) to postpubescence (noted as stage 3) occurring in the summer between 14 years 8 months and 15 years 3 months. The actual weight, height, and strength of grip at 13 years 8 months is given on the line above the table which notes only increments:

[A. J. F., height, 148 pounds; weight, 41.7 pounds; strength, 32.]

	Stage 1.			Stage 3.	
	13 years 8 months.	14 years 3 months.	14 years 8 months.	15 years 3 months.	15 years 8 months.
Increase in height—centimeters	....	2.0	1.7	5.4	4.5
Increase in weight—kilograms	....	.9	.9	4.5	5.3
Increase in strength—kilograms	....	−2.0	−1.0	9.0	5.0

This table is typical, and shows, moreover, that accelerated growth in weight, height, and strength occur together, and not in sequence, as St. Hilliare has stated.

Referring to the whole progress from birth to maturity, we can catalogue the appearance of each new added structure, function, and mental ability, the whole forming a complete series from start to finish. Nor need we end our catalogue with maturity, for even on this high plateau appear new physical features, and mental traits which determine important epochs in human life; even after this, the downward slope of existence shows salient points, such as menopause, canites, and tissue hardening, which mark physiological stages of exceeding definiteness and importance.

In this catalogue of events, physiological and mental growth do not proceed in an orderly fashion year by year. Some may be hurried, others retarded. Individuals rush past others for a time, and then lag behind. Whole nations seem to develop rapidly up to a certain point and then fall back behind others of steadier growth.

We can not tell, from the number of years which the individual has lived, what stage of development he may be in. The calendar and the chronological age based upon it do not give us trustworthy information; and, strange to contemplate, the general error of science, medicine, and education is a blind adherence to a chronological age.

To illustrate that important measurable differences exist between boys of the same chronological age who differ only in epoch of development, the following table of weight by half years and stage of pubescence is given. (Prepubescence 1, pubescence 2, postpubescence 3.) From this table, it is apparent that postpubescents average about 10 kilograms heavier than the prepubescents of the same age. The differences are most marked and striking. In one age group (14.25) 102 postpubescents out of 222 are heavier than the heaviest prepubescent of the same age, a fact which accentuates the absurdity of considering the two groups as one, as we have done hitherto.

Weight and pubescence.[1]

Weight (in kilos).	Age.											
	12.25 years.			12.75 years.			13.25 years.			13.75 years.		
	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.
20–24							1				1	
25–29	2			1			10	1		11	3	1
30–34	4			11	4		44	13	2	73	22	7
35–39				13	5		45	22	6	57	38	20
40–44				1	2	1	12	10	12	20	21	30
45–49								1	5	3	8	24
50–54						1			3		1	9
55–59						1			2			4
60–64									1			1
65–69												1
70–74												
75–79												
80–84												
85–89												
Total number	6			26	11	3	112	47	31	164	94	97
Average				35.19	36.59	(50.8)	35.04	37.18	44.27	35.40	37.98	43.84
Sigma				3.17			4.17	4.04	7.02	4.27	5.26	6.94

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[1] American Physical Education Review, Vol. XII, Nos. 3–6.

Weight and pubescence—Continued.

Weight (in kilos).	Age.											
	14.25 years.			14.75 years.			15.25 years.			15.75 years.		
	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.
20–24	......	......	......	......	......	......	......	......	......	......	......	......
25–29	17	5	......	6	3	......	1	1	3	1	1	1
30–34	54	25	8	25	26	8	11	17	9	8	6	4
35–39	46	59	44	40	53	46	22	45	32	7	11	22
40–44	22	27	68	11	29	62	7	18	65	2	7	55
45–49	......	13	52	2	9	76	5	6	70	1	9	78
50–54	......	2	27	3	3	57	......	4	61	1	2	62
55–59	......	......	13	......	1	19	......	......	31	......	......	40
60–64	......	......	6	......	......	6	......	......	13	......	1	14
65–69	......	1	3	......	1	4	......	......	3	......	......	2
70–74	......	......	......	......	......	4	......	......	......	......	......	4
75–79	......	......	1	......	......	2	......	......	1	......	......	......
80–84	......	......	......	......	......	......	......	......	......	......	......	......
85–89	......	......	......	......	......	......	......	......	......	......	......	1
Total number	139	132	222	87	125	284	46	91	288	20	37	283
Average	35.13	38.63	45.45	36.76	38.86	47.21	37.93	38.76	47.70	36.75	41.29	49.31
Sigma	4.49	5.67	7.47	5.17	5.88	8.07	4.75	5.06	7.81	5.76	7.11	7.78

Weight (in kilos).	Age.								
	16.25 years.			16.75 years.			17.25 years.		17.75 years.
	Stage 1.	Stage 2.	Stage 3.	Stage 1.	Stage 2.	Stage 3.	Stage 2.	Stage 3.	Stage 3.
20–24	......	......	......	......	......	......	......	......	......
25–29	......	......	......	......	......	......	......	......	......
30–34	1	1	1	......	1	1	1	......	......
35–39	1	3	7	......	1	......	......	......	......
40–44	1	2	21	1	1	9	1	5	1
45–49	1	......	34	......	2	29	......	15	3
50–54	......	......	46	......	......	25	......	7	8
55–59	......	......	31	......	......	22	......	12	4
60–64	......	......	13	......	......	13	......	10	2
65–69	......	......	1	......	......	2	......	4	5
70–74	......	......	......	......	......	1	......	......	......
75–79	......	......	1	......	......	......	......	......	......
80–84	......	......	......	......	......	......	......	......	......
85–89	......	......	1	......	......	2	......	1	......
Total number	4	6	156	1	5	104	2	54	23
Average	(40)	(38.32)	51.55	(42.5)	(41.5)	53.51	(37.5)	54.92	56.41
Sigma	......	......	7.57	......	......	8.24	......	8.59	......

Strength of grip, and height, have been recorded in the same way in over 6,200 cases, and the differences of these two characters are as great as those observed in weight.

Scholarship also varies with pubertal stage. In the high schools the postpubescents do from 30 to 50 per cent better in their studies;[1] in the elementary schools the prepubescents lead from 30 to 47 per cent.[2]

EDUCATION.

The particular periods when instincts appear have (in small part) been noted, and appropriate instruction has in the main been provided, but the great failure of education to-day is its inability to recognize the fact (where it is absolutely essential that it should) that children differ in rapidity of development. Its maladjustments are particularly evident and distressing at or about the time of puberty. The change from an asexual to a sexual life may occur at any age from 6 to 20 years, usually between 12 and 15, but when it does occur, the changes are profound. In the short space of six months the child becomes a man or a woman, and the process is fraught with the dangers and turmoil of a new birth. There is an outburst of physical growth, 4 to 5 inches are added to height, 30 to 40 pounds to weight, and strength may be doubled in a short space of time. New mental abilities appear, while others disappear, the type of play changes, new companions are sought, new likings, tendencies, enthusiasms, and emotions make up the whole life. Old landmarks of life fade and new ones are eagerly sought.

The sexual ripening determines an entirely new outlook upon life, the earning instinct looms large in the boy, and the home-making instinct in the girl.

The important fact that is constantly disregarded is the fact that the pubertal change leaves the child a wholly different being—different mentally, physically, morally, and ethically from the children in the stage just left behind.

This disregard results in the endeavor to teach classes that are composed of children of both prepubertal and the postpubertal stages, the immature and the mature.

Sitting alongside of each other, receiving the same teaching, subject to the same regulations and discipline, are children three or more years past puberty, and others three or more years lacking before the change will occur. The result is a chaos. No one course of study can be fitted to their disparate needs, and no one form of discipline can be enforced with each group with equal success.

This condition obtains in the whole of the grammar department of the elementary school, and in the first year of the high school. It is particularly troublesome near the point of articulation of the two schools.

The elementary school commences theoretically at or about the age of 6, when the child is able to go to and from school, and has become a burden at home, which the head of the home, the mother, can and should shift in part to the shoulders of the public. The lower school has for its opportunity the years up to the time when the child reaches its pubertal age. This is between the age (on an average) of 13 or 14; hence, allowing for slow progress, there will be about 7 or 8 years for the elementary school. From ages of experiment, it has been found that the child will not study in school after this epoch has been reached unless undue compulsion has been used. The elementary school is naturally self-limited by the advent of puberty. The postpubescent child is often kept in the elementary school by force of will and authority, and what is worse, he is subjected to the same treatment as the immature child.

The National Education Association, in its July meeting, in 1911, adopted without dissent declarations containing the following:

> That the laws should recognize the difference between the chronological age of a child and his maturity, and that the school-age limit of each individual child should be determined by requiring the child to meet physical and mental tests, even though the child be in years above the age standard; in other words, a child's actual age should be determined by physio-psychological data corresponding to the normal standard for the age limits required by law. All children or persons failing to meet such maturity tests at the extreme school-age limit should remain under public supervision and control, either until they reach maturity or permanently.
>
> The same principle should be the guide in determining whether a child is fit to be employed in any occupation. Not whether a child is 14 or 16 years of age, but when he possesses the maturity of body and mind proper to a normal child of that age should he be released from the guardianship of the State, of the community. Child-labor laws should be so modified as to meet this requirement.

The section on preventive medicine of the American Medical Association revised the report of the committee on medical inspection of schools, which broadly recognized the doctrine of physiological age:

> Scope of the examinations: Physical and developmental examinations should be sufficiently extensive to ferret out and determine, as far as possible, the causes of arrested growth, physical and mental.
>
> 1. The data of these examinations should serve as skilled information to parents and teachers in recommending and advising medical and dental aid essential for health and development.
>
> 2. When taken in connection with the school curricula and sociological factors of the pupils' environment, the data of these examinations should form the essential basis for the adjustment of educational activities, both physical and mental, to meet the requirements of physical and mental health, growth, and development. Further, it recommends "that not only the content of education, but all the processes of education, should be considered in relation to the health and growth of pupils and students. It challenges every subject of instruction and every principle and every method of education."

Its central problem is growth and development. To this end physical and developmental examinations ought to determine defective physical and mental conditions, developmental periods of growth and stages of development, physiological age, and, as far as possible, mental age. Further, it recommends "as far as practicable, the grouping of pupils in accordance with development age."

PRACTICAL APPLICATIONS OF THIS PRINCIPLE.

Those working with backward and exceptional children have very generally adopted the principle of classification on the basis of various physiological and psychological epochs. Most prominent in the application of this method have been Goddard, of Vineland, and Groszmann, of Plainfield. Many of the Young Men's Christian Associations of the country now record pubescence on their examination records and regard it generally in the classification of their boys' departments. In many more they have divided the boys for the purpose of athletic competition on the basis of weight, which is a fair approximation to an actual division upon physiological lines.

In the New York City high schools this record has been made for six years, and in one high school there has been a division of classes upon this basis. In all schools athletic competition is based upon weight. In the management of boys in many summer camps the doctrine of physiological age has been applied with excellent results. Dr. George L. Meylan, of Columbia University, in his White Mountain camp, on Lake Sebago, classifies his boys into two groups—the immature and the mature—on the basis of the pubescence sign, and these two groups are again subdivided into two. He finds the boys have a "better time" grouped with mates with whom they would naturally associate under normal conditions. It is easier to select masters who are particularly able in handling one or the other groups, the more vigorous camp and field work can be given to the more mature group, and the immature get the kind of care which they particularly need, and which would be interpreted by the mature as restrictive measures. Sports, training, and competition are readily made to fit each group, and the handling of the camp resolves itself into natural and distinct departments. He disregards chronological age entirely, placing some boys of 14 in the most mature group and others of like age in the least mature group, as their stages of development warrant.

In the High School of Commerce eight sections of the entering class were arranged in homogeneous developmental groups on the basis of pubescence, and the remaining four were not so divided. In the arranged eight sections the rate of discharge from school was 35 per cent less than in the four unarranged sections and 33 per cent less than from the previous entering class, also unclassified:

Dr. William E. Grady, principal of Elementary School 64, Manhattan, offered to put into actual practice this doctrine. Since it was impracticable to observe the pubescence sign of puberty, the writer visited the school and divided the boys of each grade from 6 B upward on the basis of mere inspection. The boys formed a line and passed in review, each stating his age to the examiner. He was then given a number—one was most mature, five the least. The following signs were noted: The voice (changed and low or unchanged and high); the presence of the second molars; height and weight;

the subcutaneous fat of the face and hands. In the immature the subcutaneous fat is more evident and adheres closely to the skin, which is of finer texture; in the mature the skin is firmer and thicker, less attached to subcutaneous tissues, which contain less fat. The prepubescent is chubby, the postpubescent may be fat, but there is an easily recognizable difference. This inspection is frankly different from the examination for pubescence, and the resulting classification may or may not differ from a division on the basis of that sign. It stands as a separate, but allied, experiment, and its results are regarded accordingly.

To one who has made full examination of tens of thousands of boys, such an inspection approximates pubescent ratings very closely. It is important to note that any close student of boys may be almost equally adept, for the principal of the school, after witnessing the classification of three classes, designated the gradings for 20 boys, 18 of which were correct and 2 varied but one step. At the promotion immediately after this inspection the boys were grouped into classes, of which there were three of each grade, so that one class contained the most mature, one-third of all who were in the grade. The remaining two-thirds, less mature, formed the other two classes without further separation.

Just before the presentation of this paper, after the experiment had been in progress nearly two months, the writer interviewed the teachers of these classes to observe any results. It was surprising to find practically all of the teachers already had much to say upon the subject of the advantage of this grouping, and that they were of that type of intellectual independence that led them to give many observations regardless of their agreement with any preconceived thesis.

ADVANTAGES OF THE HOMOGENEOUS GROUP.

I present the opinions as follows: Social consciousness is solidified; a feeling of solidarity in older groups becomes apparent, whereas in the mixed group the older boys found themselves separate and often isolated individuals. The tone and consciousness of the class was one in which the most successful scholars, who were mainly the immature, became predominant and the older boys were out of the social current. The separation of the mature group from the immature gave a class in which each exhibited to all the similar aspects of maturity, and allowed them to feel the presence of neighbors of their own kind with similar social and scholastic tendencies, abilities, and disabilities. As one teacher expressed it: "In the mixed class the older fellows didn't get together, now they do." This feeling of solidarity has resulted in making discipline easier for teachers who recognized it, and harder for teachers who did not. Practically all the teachers became aware of the change, as it developed, and adapted their methods of control to meet the occasion.

With the younger group, the stern authority of the teacher carried the day; the ipse dixit was appropriate and sufficient. With the mature group, this class consciousness instantly arose against any punishment where innate righteousness was not apparent. The paternal method was not to be tolerated, and treatment which recognized the intelligent and reasonable manhood of the group was demanded and obtained. Discipline became fraternal; a thing belonging to the class, which the class regulated for itself. The teachers came to know this quickly and adopted a method which bore all the essentials of a self-disciplining self-government. As one teacher says, "You can treat them like men now; you couldn't before; for the youngsters couldn't understand it; and, besides, the shame of criticism before inferiors (the immature) made them surly."

Reaction to studies.—The separation of the mature group made perfectly clear that this group was different, and, in the main, less successful in their studies than the immature. They are, in general, the slow students, or they would have completed the school course long before. One teacher states: "They were 40 per cent slower, and intellectually clumsy." There is a general agreement among all teachers that the big boys are doing better by themselves, because they are free from the irritating superiority of the smaller boys, whose success was likely to be held up to them as a pattern and example. They feel more at home, and work with a much better spirit, and will plod energetically along in a task that is given to them.

Above all, the teachers report that the older boys must be given work that appears to be reasonable. The learning of rules and the attack of a problem from the academic standpoint bring little reaction, while the application of a principle to present or prospective experience is grasped with a positive avidity. The immature will often collect information with the same interest that they collect postage stamps; the mature see the matter in a different light. This principle once sensed, applied teaching becomes easier and learning more rapid, and dull boys become earnest workers. Many of the teachers were so emphatic on this point that they urged the necessity of new subject matter and different pedagogical methods, and have begun to adjust both matter and method to the problem.

The younger group are inclined to take the teacher's word for the importance of the subject and react well to the descriptive, specific, and particular, while in the older group the general is sought and appreciated. It is evident that there is present the result of the budding of a desire, and an ability to organize knowledge upon a conceptual and reasonable basis and to adjust the same to present experiences, rather than a characteristically immature desire to acquire various kinds of knowledge and proficiencies which are valued for themselves and significant as acquisitions, and for which the value of use has but a minor appeal. This is but another way of expressing the statement, found in one of my earlier reports, that the "earning instinct" has arrived and has colored all intellectual processes.

Arithmetic.—A teacher, who instructs both mature and immature classes, states that there are decided differences in their respective reactions to teaching; the immature will do anything you tell them to do; for instance, they will learn the rules and mechanism for doing square root without question or resistance, and will be able to accomplish the desired result. The mature group find it difficult to do anything for which they can not see any practical value. If the problems are given a business application, however, they (in the words of the teacher) "jump at it." The younger group are malleable and docile, but the mature must be shown something "real" upon which to base their interest. The old mixed class required the teacher to use two methods, or to use one method for only half the class at a time. The new plan gives one a chance to choose the proper material and the proper method of using it, which is different for each of the two classes.

Penmanship.—In the old plan of mixed classes the mature boys considered it beneath their dignity to work seriously in penmanship, for the smaller and more agile immature boys were far superior to them. "Well, he's a kid, and he can do it," was the general attitude. The teacher of penmanship realized the open avenue of attack was along the vocational line, and, following it, enlisted the strong cooperation of his mature group. They appeared before as isolated, slow, and poor performers, continually at a disadvantage; they now have the feeling of working shoulder to shoulder with their own kind and for a common intelligent purpose.

English.—The younger group are interested in description, and do it well. Their imaginations are lively, and fairy tales still retain a significance, while the older group seem to have lost the fancy which roams afield, and would center their attention upon the facts of life. While their ability to describe the hypothetical, historical, or the imaginative is apparently diminished, it is really made more intensive, and focused upon experience. They become more adept at exposition, and can state the import of serious matters of their own personal interest with becoming facility and directness. It is easy to interest them in elaboration of subject matter, and difficult to keep their attention centered in analysis and syntax, which appeal strongly to the immature.

In singing, it was, of course, found that the mature had changed voices, and this facilitated the arrangement of classes in assemblies where it was an advantage to segregate those singing different "parts."

In physical training, the most apparent differences in reaction time, and in the ability to do vigorous work, were noticed. What would exhaust the immature was just right for the mature, and what would fit the immature was not sufficient to stimulate the interest of the better developed. It is certainly obvious that no single period of exercise can be made to fit equally well two groups, one of which is from 30 to 50 per cent stronger than the other.

This experiment has demonstrated first the ease with which a school may be arranged upon the basis of physiological age, and the advantages which may result from it. The results substantiate the claims made for this method in my previous reports, and may be summarized as follows:

1. Boys in a homogeneous class feel more at home, and form for themselves a coherent social consciousness.
2. Consistent methods of management and discipline may be adapted to the whole class.
3. Choice of subject matter may be made appropriate to all, instead of a fraction of the class.
4. Teaching methods and manner of appeal may be chosen with the problem of but a homogeneous instead of a diverse group of students.

The whole should render school management more simple and teaching more effective.

The practical application of this doctrine will result in the removal of the immature from the high school, where they do not belong, and where their scholarship is poorer than the mature. They may be kept in a ninth year added to the elementary school. This will leave the high school to the mature alone.

The mature should be removed from the elementary school and placed in subgrades added to the high school, or in an intermediate school, where their young adult possibilities may be fostered and find unimpeded development.

CHILD LABOR.

During the last 20 years there has been an organized movement toward the enactment of child-labor laws, and no legislation has been, on the whole, more beneficial to the child and the community at large. It has in the main protected the child from the strains of labor and conserved the health of the workers of this generation and has saved the lives of countless children.

These laws are, however, faulty and irrational, for they are based upon a chronological age. Immature children of 14 are allowed to work, even though they will not become mature for two or three years afterwards. Mature children under 14 are not allowed to work, even though they are strong young men and women who have passed the stage of puberty years before, and are relatively well ripened for the strains of life. This is manifestly absurd. The only rational procedure is to place the question of allowing children to labor, or not, upon the result of a physical examination to determine their maturity or immaturity. The sign of puberty, pubescence in the male and menstruation in the female, or, if feasible, pubescence in both, may be easier of determination, and, moreover, be a proper criterion.

Rotch, of Boston, has placed before the public recommendations to the effect that the appearance of ossification centers in the wrist should be used for this purpose. While this criterion would be important if it were true, it is, unfortunately, not true. Up to the present time, in several bulletins issued by Dr. Rotch, there is, unfortunately, not a shred of evidence that the development of the bones of the wrist have related to them in any way any physical or mental ability of any kind, and not until this evidence has been presented can we in any way give attention or credence to the claims of this method.

Dr. Rotch's developmental processes, which cover about the stage of the appearance of puberty, and are labeled H, I, J, and K, differ from each other only in the fact that they are the same as the previous stage, " only more so "; that is to say, stage J differs from stage K only in the fact that the bones are slightly more developed and more massed together. Unfortunately, this is a matter of opinion that is not objective enough for scientific or practical purposes. Also, there is no particular reason why the bones of the wrist should be given preference to the bones of the ankle or any other convenient part of the body. This is particularly distressing, for we have found that ossification does not proceed regularly throughout the body. There is even a difference between the right and left wrist, and if we were to follow Dr. Rotch's ideas we might be forced to put the left hand at work and to keep the right hand idle.

SUMMARY.

There are in childhood and adolescence easily distinguishable epochs of development.

Children of the same age but in different epochs may differ from each other 50 per cent in degree in certain characters and wholly in kind in certain other characters.

There are certain easily recognizable signs which may guide us in distinguishing the different epochs of development.

Children of wholly different developmental abilities are now taught by the same educational process. This is absurd and should be stopped.

Every scientific study of children (particularly of those from 10 to 15 years of age) must contain reference to physiological age, and no scientific study is complete without such reference.

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[1] Op. cit. pp. 23–32.

[2] Pedagogical Seminar, Vol. XV, pp. 230–237.

WEDNESDAY MORNING, SEPTEMBER 25, 1912.

THE RELATION OF TEACHER AND PUPIL, WITH ESPECIAL REFERENCE TO THE EDUCATION OF IMMIGRANTS AND OF THEIR CHILDREN IN AMERICAN PUBLIC SHOOLS.

Dr. William Estabrook Chancellor, New York, N. Y.

The problem of how to keep children in school became apparent when compulsory-education law enforcement did keep them in school until they were 14 years of age. Then, as Dr. Leonard P. Ayres showed us in his epoch-making book, Laggards in Public Schools, they fell out by millions, as down an educational precipice. We have only 2,000,000 boys and girls from 14 to 19 years of age at school, when statistics show that we might have 9,000,000. Of these, however, 3,000,000 are not educable, at least by modern methods, beyond the sixth grade. Our problem is, therefore, how to keep more of the 4,000,000 educables now out of school in school.

In a general way, not drawing fine distinctions, we may classify youth into these grades and kinds of ability, viz:

Grades of ability.—Eunoiacs (well-minded), morons (habit-minded), imbeciles, idiots (abnoiacs or nonminded), and paranoiacs (side-minded) or insane.

I yield to none in zeal to improve the condition of the poor and of the defective; I would not diminish by a hair's breadth the significance of poverty and of physical defects in retarding pupils. But, in handling tens of thousands of school children in Paterson, N. J., and in Norwalk, Conn., in comparison with a different kind of children in the District of Columbia, I came upon a discovery which is the cause of this communication. I found that the frequently retarded school child of foreign birth or parentage is the victim of a false educational relation—that his most important need is of the right kind of teacher.

This is a matter of technical school administration that is largely at fault. Usually, the youngest teachers are assigned to the lowest grades. Such is indeed the law here for the District of Columbia as enacted by Congress. All beginners, male or female, begin in first or second grade. Now the objection is not to the beginner, as such, but to certain kinds of beginners, as these statistics seem to show.

For my data I present the situation in the town of Norwalk, Conn., founded in 1641, present population 26,000, school enrollment 4,500 pupils. It is an example of social fact that the kingdom of the Anglo-American here is being divided and given to another because he has been found wanting. Of the school population, 600 are of colonial or ante-bellum descent; the rest are "foreigners." Of these latter, 400 are of Irish and German descent of but two generations, but, being thoroughly Americanized, they should be counted with the Anglo-Americans, for practical purposes; 3,500 are of recent European or other non-American origin, representing 42 different nationalities, mostly Hungarians, Bohemians, Italians, and Russian Jews.

Because we know now that heredity is not additional and accumulative, but selective and multiple, not of some ancestors but of dominant ancestral traits, I submit the facts as to the marriages for several generations whence these 4,500 children sprung.

Marriages.

Total number under review	14, 000
American upon both sides	4, 000
Foreigners of the same race upon both sides	8, 800
Mixed marriages, total	1, 200
Foreigners with Americans	700
Foreigners not of the same foreign race	500

By "foreigner" I mean when either foreign born or one remove from foreign birth. In every single instance, there being absolutely no exception, in the 700 marriages of foreigners with Americans, the female was American, the male foreign. I have no exact statistics and can not say definitely in how many of these 700 marriages the American woman was really but at the second remove from foreign birth and of the same race as her husband; but I have a definite opinion that, in over one-half the cases, the American woman was more than two removes from foreign birth, and also not of the same original nationality as her husband. I know many cases where she was genuine Anglo-American, that is, Yankee, and many other cases where she was either Irish or German in part and Anglo-American in part.

Of the 500 mixed foreign marriages, in only 7 cases did they marry across the degrees of latitude. They ignored religion and race and nationality and language, but they did not ignore north and south. Almost no northern European cares to marry a central or south European, and almost no central European cares to marry a north or south European. Often the Slav married the Celt, the Teuton the

Scot, the Russian Jew the Hollander across many degrees of longitude. In nearly all cases the males came from eastward of the females; that is, the Irishman married the American resident; the Englishman, the Irish woman; the German, a Holland woman; the Russian, or Russian Jew, a German woman.

When he can secure an American-born, English-speaking wife, the foreigner male does so. He seeks to identify himself as an American. But, on the contrary, the foreign woman never marries an American man. She either marries a foreigner, or stays unwed. Here is a sex difference worth considering.

Of these 4,500 children, 170 represented three or more races within three generations. Perhaps the most interesting case was that of three children whose father, born in Scotland, had a Norwegian fisherman father and a Bohemian peasant mother, and whose mother was of old colonial Yankee stock, herself and her forefathers, for several generations, college graduates.

These foreigners, in selecting American wives, choose the physically and intellectually superior. Their marriages have as issue less than one-half the average of foreign families. But the quality is notably superior. Every race intermarriage bears only American children. The boy whose father is a German but his mother is Irish can be neither German nor Irish in sentiment, but must be American. The "old country" is never talked of in such homes. The boy whose father is a Pole but whose mother is a French Canadian talks English at home.

All the problem, therefore, of Americanizing the foreigners' children rests with those families both of whose parents are foreign of the same race and language. The influence of the genuine Anglo-American children upon these foreign-environed children is benignant. Being American, mainly, they let them alone. They never attack them. They never order them about. They play games with them, and even teach them how to play. But they cross their paths infrequently. But between the foreigners often there is war, especially between those whose race habits were widely separated in latitude, as the Hungarians and Italians, who are notably antagonistic.

It is a situation of race recomposition and of social kinesis. There is a deal of friction about the mills and tenement streets. Part of the explanation consists in somatological facts. The Slavs represent a high form of brachycephaly. I have measured a child whose cephalic index was as high as 121°; several children above 110°; and many above 88°. That, indeed, is the average. Over against the Slavic extreme brachycephaly stands the South Italian dolichocephaly, often as low as 67°, and averaging 68°. Here and there in this social aggregation are new Teutonic foreigners, with their rectangular dolichocephaly runnning about 77° or 78°. The cephalic index means something. For one thing, the brachycephalic races of Europe are all of them devoted to communal life. They are anti-individualistic. Moreover, they are also plateau peoples, with large lungs and short thick bodies. The Mediterranean, South Italian race, highly dolichocephalic, is impulsive, individualistic, passionate. And we must Americanize them by teaching them to live together in mutual forbearance. With their prolific families, they are to be the heirs of the laws, institutions, buildings, land, ideals. In all the great cities, from Portland, Me., to Portland, Oreg., the Anglo-American is giving place to the dolichocephalic Russian Jews, the brachycephalic Slav, the yet more dolichocephalic South Italian, Greek, and Syrian, and to such as these.

The frequent assertion that we are both educating and Americanizing the foreign children is sheer error. It is an assertion often upon the lips of men themselves not Americanized, and scarcely educated.

To be educated is to have one's powers released and trained, to be developed to the norm of one's natural inherited capacities. To but few persons in any land does this good fortune ever come. To be Americanized may be to be either more or less than educated; it is a different thing. Few of the foreign-born or of their children, unless they represent mixed marriages, are ever Americanized.

To be an American is to seek neither to please nor to oppress; the American is on the level; he can not cringe or cower, and he would not tyrannize. He is indifferent and tolerant. Americanism is far easier for some temperaments than for others. It is, of course, easiest for the rectangular dolichocephalic. The average Anglo-American has a cephalic index of 78°; so has the Yorkshireman, the Dane, and the Swede.

Americanism is impossible to some grades of ability. The idiot, the imbecile, even the moron, can not compass Americanism. Perhaps, with plenty of play and spontaneous occupation, we can save the South Italian and the Hungarian and the Russian Jew from becoming morons, as they are so strongly inclined to do.

Americanism is impossible with certain types of national mind. Races and nations have certain kinds of minds. All foreign peoples, as such, have one characteristic that is not American. Until we drive another idea in to take its place, we can not Americanize the foreigner. He and his son think poorly of women. He does not understand what we think of women. Of course, to Americans, our idea is simple enough. An American man looks upon woman and women as his equals, neither better nor worse, nor so different as not to be perfectly human. With him, his wife, his mother, his sister, his daughter, and every other woman is just another person. To her sex he yields just one point, one only; he remembers the fact, and is a little more considerate of the woman's feelings. But even the foreign boy thinks himself superior to his mother and his teacher. When he is told the contrary, like his father, he supposes that the woman wishes to be treated like an angel, which is not so in the least. She wishes to have it understood that there is no sex in rights, in privileges, in laws, or in ideas, except in the single sex fact.

Unfortunately, we have not used the right kind of woman as proponents of this strange idea to the foreign child.

There are two general kinds of temperament, the motor and the sedentary. The motor temperaments are both active and resistant, the sedentary temperaments are passive and acquiescent. Temperament is more than an atmosphere of the soul, more than a temporary condition of the body. It is a physiopsychical character. This character is displayed in the time rate, which varies as 5 to 1 with various perfectly normal and sane individuals. The slow are not merely retarded or belated, they are on the slow freight. The fast are not merely ahead, they are on the fast express. The temperamental character is displayed also in the physiopsychical field. Some persons can consider two facts at a time and relate them; others, three; a very few, four; but many do not naturally consider; they act upon one fact. It is highly significant that in general, with exceptions, the fast do not consider many facts and the slow do. The express makes time, but the freight pulls the load. Again, the temperament is displayed in the action force, the action continuance, and the reaction. And it is displayed in certain characteristic emotions or affectional states.

We may grade temperaments in two ways, viz:

I. Temperament by time rate: (1) Precocity, (2) normality, (3) altricity.

II. Temperament by energy: (*a*) Motor—(1) Sense or "nervous," (2) sinewy, (3) muscular; (*b*) Sessile—(1) Vital or "corpulent," (2) reflective or "anemic."

Some races are precocious; as, for example, the South Italians, the real Negroes, the Celts (generally). Some races are altricious, as, for example, the Hungarians and the Swedes. It is significant that there is a precocity of mind that robs the body and makes it altricious, and there is a precocity of body that robs the mind and makes it altricious. But in the great majority of cases—in at least 80 per cent, in my opinion—physical age and psychical age are in close correspondence.

Every race has its characteristic temperament or temperaments. The Anglo-American is usually sinewy motor. The increasing muscular character of Anglo-Americans beyond the Appalachians indicates a considerable race change due to climate and to agricultural labor. The Hungarian is heavy muscular motor. The South Italian is sense motor. The Russian Jew is sinewy motor.

I am aware that food supply and other factors make changes in individuals and in races, but I have specified the facts now present. Incidentally, I note that slightly shortened food supply stunts; much reduced causes height and thinness; greatly curtailed induces extreme sense disturbance and ends in nervous exhaustion. To give full normal race height and size and not overheight or under, overweight or under, a normal diet in quality and quantity is required, plus the characteristic race regimen and environment. In other words, American indoor city life is greatly changing the European outdoor rural laborer.

Human beings are their heredity times their environment. Biologists may say that heredity is far the larger factor, sociologists may press environment; but the main point is that we have here factors in a product, not addends in a sum. The school is a factor in the man, not an addition to a child. In multiplication every factor is vital.

Again, the human being is his physical body times his ideas, his mind, his soul. This mind or body or ideas or soul is his heritage of instincts, of capacities, of unit traits times his spiritual environment—that is, the ideas of his surrounding human society.

Now, the true significance of temperament consists in the fact that it causes selection or rejection of ideas. Each temperament is hospitable to some ideas, indifferent to others, hostile to yet others. Every man counts his own qualities as desiderata and his very deficiencies as virtues; and the qualities of other temperaments contra until life teaches him otherwise in some day of awakening and of regeneration.

Races also are hospitable or hostile to temperaments; many Europeans love, all Americans hate, the parasitic sessile—that is, lords. We scorn the scornful, refuse to admire them. And yet we have something to learn from the communalism of the Alpine and Carpathian Slav, to whom we are giving place; perhaps his temperament will save us also from the excesses of individualism.

The statistics of the town show that where the parents insist upon speaking the vernacular at home, the children get belated two grades; but though both parents are foreign, when they try to speak English at home the children are usually belated but one grade. Well-educated foreign parents by their good knowledge handicap their children. The Yiddish home conversation of the Jews retards even this precocious breed. The best condition is where the foreign parents speak their own vernacular and English together, not being conscious which is which. In such a condition the children practice English, teaching their parents.

It was over two years ago, when investigating the number of words in the vocabularies of fourth-grade children, that I stumbled upon my discovery. It made a deal of difference what teachers had the children in the lower grades, and it was a certain kind of teacher who rendered the service.

For lower-grade teachers we take either every beginner or the quick, vivacious, sympathetic, and attractive young woman. Sometimes a beginner succeeds with foreigners; but the quick, vivacious, sympathetic young woman never succeeds with them. I could cite a score of instances with minute explanatory details. The reasons of failure are two. First, the foreigners do not respect such teachers. Second, most of the brachycephalic and of the other non-English-speaking children are too slow to understand them. With the very teachers who do beautifully with the Anglo-American or Celtic-American children, the Central, East, and South Europeans do miserably, going usually but three grades in two years. But with other teachers I have made a fair correction. I shifted the attractive, vivacious young women to higher grades, and set stronger, less sympathetic, more dominant, older, muscular motor women in their stead. The result in two years in four of the urban foreign districts schools is told in these statistics, viz:

Numbers in grades.

Grade.	1907-8	1911-12
Fourth	195	306
Third	230	340
Second	260	375
First	395	350
Kindergarten	276	270
	1,356	1,641

Translated though these figures might easily be into graphic charts and curves, they are eloquent even as they stand. Much more could and should be done for these foreign-born children. But I feel warranted in saying that if the right teachers can be found and employed, the problem is more than half solved. We have gone from a condition where retardation and repetition were also concealed in part by calling many second-grade first grades to a condition where it is unusual to find more than two or three children in a classroom of 40 more than one year older than the course of study contemplates, which is this, viz:

Grade age.

	Years.
Fourth grade	9-10
Third grade	8-9
Second grade	7-8
First grade	6-7
Kindergarten	4-6

Already the change in policy has recorded itself in the higher grammar-school grades. In 1909 there was not one Hungarian child, with nearly 400 enrollments, in such grades. In 1912 three completed eighth grade, a girl of 15 being first in the class. She had justified her race altricity by standing higher than any one of the precocious 12 or 13 year old girls or boys of other races. It was not in the least a case of race sympathy with the teacher, who was a solid, mature, calm, Celt-American; literally, half-Irish, half-Yankee. The class represented a dozen different races.

SUMMARY OF PROPOSITIONS.

I realize fully that the propositions foregoing can not be accepted as finalities; I do not offer them as such, but as modes of opinion, as suggestive bases of departure.

1. Temperament is a living fact, and it is an illusion that ideas change temperament. On the contrary, temperament rejects, selects, revises, and edits ideas. Temperament is the form and mold but not substance of mind.

2. But physical environment, especially air and food supply, do modify temperament, slightly in the individual, occasionally more so in his offspring.

3. Different temperaments are more or less antagonistic. Certain temperaments are modifiable into dispositions from inner experience in social relations. Such modification is slight, and usually but superficial.

4. Temperament is fully displayed in children about 10 years old. Children of certain temperaments drop out of school as soon as the law allows.

5. Races have typical minds.

6. The feeble and the habit minded are scarcely to be Americanized.

7. The best teachers for the foreigners in school are the muscular-motor, relatively resistant, and energetic, mature women. It should be the practice of school administration to assign such women to foreign classes. Such teachers can enforce American ideas.

8. Among the essential ideas of Americanism are: (1) The equality of all, including that of men with women. (2) Individual self-reliance. (3) The duty of self-improvement, because here is opportunity.

9. We can save for higher education the educable eunoiacs and morons only by right education in their first years at school. This right education means progress from motivation to sense intelligence, or to efficiency, and culminates in personal morality. Some stages are easy to some temperaments, hard to others, and vice versa.

10. In short, education, though universal, can not be uniform, but must be adapted to races, to temperaments, and, in substance, to each individual.

DISCUSSION.

Dr. **Maximillian P. E. Groszmann**, Plainfield, N. J.: Some of the points in Dr. Chancellor's paper might be disputed. But he has emphasized some very important facts. He has shown that there is an essential difference between retardation and arrest of development. The extraordinarily slow child he spoke of is nevertheless normal in capacity, although abnormal in rate of growth, consequently can not be classed as mentally defective. He further showed that the keeping of the mentally defective, of the uneducable, is not a public-school problem at all, but one of segregation. The school is concerned only in the educable child, though he may be retarded or handicapped in many ways. The problem here is to understand the differences in capacity, in rate of growth, in racial attitude, in temperament, in economic condition. It is time that we cease to approach this problem from the feeble-minded end and to concentrate our attention upon the educational needs of the educable child.

RESULTS TO INDIVIDUALS FROM MEDICAL INSPECTION.

Dr. Leo Burgerstein, K. K., Regierungsrat, Vienna, Austria.

State regulation of medical inspection is necessary to secure its benefit to the greatest number; mandatory laws are needed to make such regulations effective, and these will be most readily enforced where grants to public elementary schooling are made by the State, and so can be withdrawn. This system prevails in Great Britain, where over $66,000,000 were distributed in 1910, on the basis of per capita attendance in the public elementary schools of England and Wales.

In those European continental states where cities and country communities pay the whole of elementary schooling expenses themselves permissive State regulation regarding medical inspection would be of little use. In states where regulations have been introduced single cities had frequently begun the work before their introduction, and are now doing more than the regulations call for.

In Switzerland, in 1900, the federal department of interior issued instructions directing that where physicians are not appointed to make medical inspection, teachers shall examine children entering schools as to mental defects, hearing, speech, and sight. In Utah, in the United States, similar mandatory regulations, dating from 1911, call for examinations in sight, hearing, teeth, and mouth breathing. A provision such as was made in the State of New Jersey in 1909 for the punishment of parents not giving needed treatment to children after examination would add to the effectiveness of a medical-inspection law. The ability of many parents to pay private physicians for treatment should make such a system an inexpensive one for the educational authorities.

Instruction at normal schools, in methods of testing vision and hearing, such as is provided for in the Massachusetts mandatory act of 1906, will make the results of tests by teachers more reliable. It should also be possible to use teachers in detecting the first stages of scoliosis, and in measuring chest growth.

The chief advantages of using the teachers for rough examinations of sense functions are three; first, that, owing to their familiarity with the children, they find it easier to obtain answers to questions than does an outsider; second, that, through their work, their interest in questions of hygiene is enlisted; third, that the method is inexpensive.

A combination of special examinations by teachers, with general medical inspection by physicians, such as is required by the mandatory regulations of the Federal District of Mexico (1908), will give far greater results.

In Ohio, the board of education was, in 1910, given the power to permit medical examinations of physicians chosen by parents, but, where such examinations are not made, to require examinations by appointed physicians. The results of this experiment are not known to me, but in Saxe-Meiningen, Germany, where medical certificates required from children on entering school may be filled out by family physicians, the parents of none of the 46,000 elementary school children chose to have the form filled out in this way. Better results in this and other points are commonly secured in the case of high-school students.

Several English acts deserve mention in connection with the subject of mandatory medical inspection. First in importance is the educational (administrative provision) act of 1907, which imposes on local authorities the duty to provide for the medical inspection of elementary school children, and gives them the power to make such arrangements as may be sanctioned by the board of education for attending to the health and physical condition of those children.

Also of importance in their results to individuals are the education (provision of meals) act of 1907, giving the local authorities the power to take steps to provide meals for school children; the children's act (1908), making possible the intervention of nurses in the examination of person and clothing; and the local education authorities (medical treatment) act (1909), which makes it obligatory for those authorities to charge the parents with the expenses of treatment, if they are able to pay.

The success of the act of 1907 was very noteworthy. It is remarkable that, from the beginning, the board of education held in view the most difficult and important question, namely, that of securing treatment. Use of hospitals and dispensaries having been made on a large scale, volunteer agencies have arisen, and school clinics have been started. As to State arrangements, much is to be learned from the acts and regulations and the reports of action taken in England. One year after the deciding bill of 1907 appeared, 314 out of the 328 educational areas of all kinds had school medical officers, and 55 local educational authorities had made arrangements for treatment. In the code year 1909–10, the school board decided that not less than three inspections are to be made during school life. During this year, 152 local authorities appointed nurses, 41 of whom were employed in giving treatments.

I must here make a general remark. The statistics which one finds in reports from different parts of the world, while often well composed, deal generally with ailments and defects found among school children; sufficient data as to the final results to individuals following upon medical inspection, that is, percentages treated and results of treatment, are rarely given. In trying to learn more by correspondence, one often sees clearly that this, the main point, is given insufficient attention.

It is a good feature of the laws of different States of America that individual examinations are required at least every year. Such is the requirement of the mandatory acts of Minnesota (1910) and Pennsylvania (1911). It is expensive to make good examinations of this kind so often, but it naturally promises much better control of the health and development of pupils, and should insure closer follow-up of cases.

I venture to say, however, that the main point is the attention given to treatment. Another good feature of American State regulations, first embodied by the Massachusetts act of 1906, and rarely touched upon in European cities, is the arrangement that examinations of teachers and janitors shall be included in medical inspection. It is sufficient to remember the many children infected by the tuberculosis germ, and that, as has been proved in Ontario, consumption can be very readily spread among the teachers; as has been shown in Denmark and England, it is probably more readily spread in different places than in other not unhealthy professions.

As to efficient arrangements for all schools in continental European States, I must refer to one example; the small State of Saxe-Meiningen, where a scheme similar to that of Wiesbaden is pursued. This system I shall characterize later. In Asia, there is the great example as to the number of children examined in Japan, where the State arrangement was introduced in 1898. In 1909, there were about 6,000,000 pupils in the elementary schools; that is, 54 per cent of all such had been covered by medical inspection. In the same year, 6,975 physicians were engaged in medical inspection, which is obligatory except in very small places. The cost of all this work was, in the year referred to, about $100,000, which means a very small cost per pupil, taking into account physicians' services only. It would be of interest to know exactly the results to individuals in the matter of treatments and cures.

In European States, in which the State does not contribute to elementary schools, the expenses for public normal schools are often paid by rate, and medical inspection can, therefore, be introduced into those schools without difficulty. This plan was followed in Austria, in 1909, and it is to be hoped that those who, as pupils, have been impressed with the usefulness of medical inspection will, as teachers, become advocates for promoting the inspection in the several communities where they will some day teach. A similar influence is to be hoped for in the future, if inspection is introduced into high schools, as, in Europe, most leading positions in the administration are occupied by those who have been pupils in such schools, and who, from their positions in administrative or public life, may promote medical inspection in the most important of all schools—the elementary school.

In the high schools in several European States mandatory medical inspection has already been introduced; in Russia (1871), in Hungary (1885), in Norway (1897), in Servia (1899), in Bulgaria (1903), in Sweden (1905), and in Saxony (1908). In Hungary the physicians engaged in medical inspection have been obliged, from the beginning, to pass a special examination. In Sweden, in case of illness, indigent pupils are treated free of charge. In high schools, the best arrangement is for the medical officers to be also the head professors of gymnastics, as is the case in the College of the City of New York and in a Latin school in Lemberg, Austria.

Whether the permissive regulations made in 1889 in Norway, and those of 1907, in Connecticut; of 1908, in Scotland; and of 1911, in North Dakota, have had greater results than the introduction of medical inspection in a small number of towns, I should rather doubt.

In no large State in the world is a complete modern medical inspection of all schools made. The greatest advancement in Europe has been made, among the larger States, in England. There are also States where medical inspection has been decreed in a general way, but without great result.

In single cities the degree of progress made in securing results to individuals is very different. General and specialistic examinations are made a different number of times during school life, with varying degrees of exactitude; hospitals and dispensaries, more or less conveniently situated, are used; general and specialistic school clinics are arranged; poor-law doctors, club doctors, and nurses are utilized; special classes for children with different ailments and defects, such as scoliosis, lameness, tuberculosis, ringworm, trachoma, defective speech, feeble-mindedness, high-grade myopia, and deafness, have been organized; different arrangements with regard to meals, clothing, footgear, bathing, open-air games, woodland schools, holiday camps, etc., have been made. As to the number of individuals reached, the good results are also different, and dependent upon how far practical arrangements have been made for children whose parents are unable to pay, and whether as a work of charity or as a duty of the community. There is no exact scale by which to judge the work in different cities, but different combinations of the various features occur, and different methods of putting them into effect. As my time is limited, I can not go into all the details concerning the various places; I choose, therefore, to mention some special cases as examples of methods employed for medical inspection.

As my first example, I choose the capital of Belgium, Brussels, which holds a remarkable position historically, and which, from the beginning, included treatments in its program. Medical inspection was introduced there as early as 1874. Annual examinations are made; also special examinations by oculists and dentists. Physicians prescribe, and janitors administer, under the teachers' control in the school itself, such drugs as iodine, iron sirup, patent food, and cod liver oil. According to the statistics composed at Brussels, and covering a dozen years, about 10 per cent of the pupils in the public schools have been treated in this way, and, out of the many thousands treated, 11 per cent have been cured, 69 per cent have improved, and, in 20 per cent of the cases, no result was obtained, or, at least, none was reported. Other Belgian cities have followed the example of Brussels in this regard, but, unfortunately, among foreign cities, I know of none that have done so except the capital of Russia, St. Petersburg, where the children also receive drugs in school during the time of recess.

Another system, introduced in 1896, is that of the German city of Wiesbaden. Of this system I shall give some characteristic details, because it attempted an economical medical inspection, and has had much influence on the development of medical inspection in other German and in foreign cities. Hurried routine inspections are made of children entering school in the first days, and are followed by more careful individual examination in the next six weeks, in order to find out which children need to be further held in view. The latter children have, on their health form, the remark "under control." At each of the doctor's fortnightly or three-weekly visits at school, a number of these children are inspected, and others are sent to the doctor by teachers, or selected by the doctor himself during his visits to schoolrooms. The whole school population is reexamined only in the third, fifth, and eighth; that is, the last school year. In this way, much time and money is saved; and the advantage of following up individual children needing attention is a great one, when weighed against the possibility that others than the "control children," needing examination, may, in spite of the doctor's visits to the schoolrooms and the teachers' care, escape notice. As to treatments, the results obtained are not very great; of all the parents advised to seek medical help, about half do so. In the German city of Halle, where medical inspection on the Wiesbaden plan is well carried out, the percentage of parents following the doctor's advice is larger; in 1910–11, 74 per cent of the 1,278 communications to parents were acted upon. The capital of Sweden, Stockholm, has a remarkable specialistic examination joined to the three general examinations; in addition to existing general and special polyclinics, dispensaries, and surgeries, several public school clinics and a dental clinic have been started. About two-thirds of the children needing treatment have been sent to specialists. Bathing is obligatory, and may be had free of charge.

Different cities, after the routine inspection and first examination of children entering schools, also make later a specialistic one as to vision and hearing. In Bradford, England, since school clinics have been instituted, all questions except that of care for clothing of poor seem to be solved. The child is examined only three times during school life. Children needing treatment are reinspected in two months after inspection, to see whether treatment has been carried out, and care is taken that no child, be it treated by a private physician or in the school clinic, shall escape. Otorrhoeic and rhinorrhoeic children are excluded from school and examined weekly at the clinic; daily syringing is performed by a nurse.

In the capital of Finland, in Helsingfors, an examination of children entering school and four examinations during the school year for all who need special attention are made. Three times a week the doctor must inspect every school under his care and, therefore, has much opportunity to discover those children with newly developed ailments. There are plenty of clinics in proportion to the population[1] and all general and specialistic treatment may be had free of charge. Ninety-one per cent of all children needing treatment are treated. As far as I know, this is the highest percentage anywhere reported in a city.

There can not be any doubt that more frequent and careful examination, leading to the detection of every ailment and case of defect and the provision of facilities for treatment, will bring about greater results to individuals. Following up cases to secure treatment is a great essential and, if I had to choose, I should prefer fewer examinations and more attention to the treatment of the examined.

Different cities content themselves with a smaller number of individual examinations than the cities thus far discussed. Berlin makes generally only one examination, at the entrance of the children to school, and issues health forms only for children "under control," to insure their being examined repeatedly by physicians who visit each school four times a year. The glorious story of the complete extermination of ringworm in Berlin, after some cases had arisen, is generally known; also glorious is the story of the extermination of this disease, not in this case a new development, in Paris, where it was stamped out by the help of the Lailler school at the hospital St. Louis. The City of Mexico has a similar institution.

There is no doubt that the economical Berlin system also produces results in the treatment of individuals, though probably not in a high percentage of cases; unfortunately, the official reports there, as well as in many other cities, give no general statement as to percentage treated or children needing treatment or as to results obtained.

A further step in economy has been made in Breslau, Germany. Here, as in Berlin, only children entering school are examined. Where, however, Berlin excludes only healthy children from further examination, Breslau excludes also children who are classed as "invalids;" that is, as incurable. As a result, out of 2,000 children under one physician's care, there are less than 300 children entering school to be examined, and only about 200 children "under control." In order to still further save time, parents are not invited to be present at examinations, as is customary, but, with this economy of time, there is a regrettable loss, even though parents are asked to fill out, and generally do fill out, a form giving their observations as to the children's earlier life. (In 1909-10, of 1,650 such forms, 1,193 were filled out.) The results to individuals of such an economical system must necessarily be modest ones. I found, from the annual reports of the years 1905-6 to 1910-11, that, on an average, only about 20 per cent of the elementary school pupils with ailments or defects were treated. I suppose, however, that "invalids" or incurables are included in the statistical sum of the total of ailing children. During the same period 6,578 letters were sent to parents and 38.6 per cent of them came back with the answer of a physician who had treated the children in question. In this total, I think, are to be included children needing treatments from more than one cause so that, altogether, though I can not get a clear view, it seems to me that the percentage of children needing treatment who were treated can not be a very high one. A further diminution of routine is the examination of those only who are noted as ailing, on a form filled out by parents or by teachers; the first method having been introduced into Meissen, the second into Gera, in Germany.

As concerns treatment in connection with examination by the medical fraternity it must be remarked that poor people generally have no family doctor and do not seek treatment of their own will except in acute circumstances.

There are also examples of very good arrangements which cost the citizens of the place in question little or nothing. In Berndorf, in Austria, two hours by rail from Vienna, examination of every child in the little manufacturing town is required at least once a year; those "under control," or about 44 per cent of all children, are examined three or four times a year. There is every facility for specialistic treatment, gratis or almost gratis, according to the financial condition of the parents; an excellent school clinic and a fine school dental clinic have been established; these are attended by specialists coming from Vienna. Home treatment is given free of charge to the indigent; rate payers contribute a very small sum.

In Dunfermline, Scotland, half an hour's journey from Edinburgh, the examination of all children four times during school life is obligatory; there are excellent clinics, general and special, as well as other up-to-date arrangements for treatment. The school clinic works free of charge for every child coming with the consent of a private physician. The county council pays half of the cost of medical inspection; rate payers have nothing to pay.

In Berndorf, while the town nominally pays the expenses, Mr. Arthur Krupp, proprietor of the large manufactories in the town, actually pays the greatest part of all taxes, and therefore most of the expense of medical inspection, besides doing other beneficent work. Dunfermline is the birthplace of Mr. Andrew Carnegie, who presented it with funds which yield an income of about $122,000, of which the trustees very wisely invest large sums in promoting health.

I have referred here with special pleasure to these examples, because in no country in the world does wealth, so often and on such a large scale, show noble common sense as in the United States. Therefore, we may hope that the Carnegie and Krupp systems of starting medical inspection, with efficient equipment for securing results, may prove an object lesson to generous citizens.

The greatest difficulties in the way of securing effective medical inspection are found in very large cities and rural areas.

London, with an elementary school population of 750,000, has a medical male and female staff, giving the equivalent of 19 whole-time physicians and 51 nurses. In 1910 arrangements were made with 13 hospitals for treatment of 33,000 children for eye, ear, and throat affections, and ringworm. The London county council paid nearly half a dollar (2 shillings) a head for the children treated and in addition about $243 (50 pounds) for half a day a week spent by every one of the treating practitioners. The rate paid for treatment by the family varies according to income, free treatment being given in case of need. These arrangements, expensive in comparison with the results secured to individuals, can only be of a temporary character, for in such a large city this system involves too much loss of time, and its control is difficult. School clinics answer the need better; in 1908–9 four such were started in London by different means. In connection with each school a care committee is appointed to deal with individual cases. It is quite impossible to go into details with regard to the methods of the largest city in the world.

The second set of difficulties in the way of medical inspection constitutes the rural problem, the solving of which is in the experimental stage. It is well known that mandatory State regulations, such as those of Minnesota (1910), or of Pennsylvania (1911), make exceptions for districts with scattered population or for remotely located places. Distances are great, physicians rare, specialists almost unknown. Roads are sometimes in a bad state, and, in consequence of the distances to hospitals, there is a great loss of time involved in seeking treatment; moreover, the population, like the poor in great cities, is not accustomed to seek medical help except in acute circumstances.

Inspection generally will be accomplished in rural districts only on a reduced scale, in comparison with good city systems, by traveling whole-time assistants or by settled rural practitioners who know the families, their conditions of life and hereditary influences; the aid of trained district whole-time nurses, possibly also of midwives with some training in nursing, may be utilized. Of special value will be the efforts of teachers to persuade parents to secure treatment. If cases are to be followed up by every possible aid, treatment centers at convenient distances, as well as flying clinics, will be of great practical help.

An experiment in the direction of using both rural practitioners and whole-time assistants was arranged in 1911 for Ailesbury, in England; similar arrangements are made in the little German State of Saxe-Meiningen, already referred to.

In the county of Hertfordshire, in England, covering about 600 square miles, are 13 rural districts, with 157 schools. The children are inspected generally three times during school life; in a few cases only once or twice. The inspector carriers with him scales, ophthalmic lenses, Snellen types, colored wool, and tongue depressors. In comparing results of the reports for 1909 and 1910 it becomes evident that there has been individual profit to both city and country children suffering from a number of defects. Almost the same percentage of parents attended first inspection of children in rural as in urban districts.

Derbyshire, in England, is a prominent rural district. In addition to urban schools there are 290 rural ones, with an enrollment of nearly 90,000 children. Those entering and those leaving school are examined; also cases presented by teachers. One month after the inspection parents who have not sought treatment receive a second letter, and if, after another month, they have done nothing, the local manager is asked what further can be done. From the single items of the reports it is to be seen that results to individuals have been attained in a remarkable number of cases, though varying greatly in the different districts. Treatment is mostly given in the hospitals. Much progress is expected to result from the institution of a "providential club" with an annual 6-pence contribution of parents for every child.

Leaving out of account the question of acute infectious diseases, the aims of modern medical inspection are three: The first is to insure the child from injury by unhealthy school premises, including print of books and various school appliances; the second is to make an individual examination of each child, with the view to finding out what should be provided in the school in order that the child may not be injured or that it may better follow instruction; the third aim is to make provisions so that treatment can readily be secured for all needing it, since schooling itself is a part of the cause of the ailings and the defects in question.

The pursuit of this third item involves a very difficult task, and that not only because of the expense involved. Experience has shown that the cordial interest of teachers, and the practical help of the excellent London institution (1901) of the trained school nurses, are most valuable means of promoting treatment. Some means of forcing parents to search for or to permit treatment should be everywhere provided as the last resort.

The extent to which the rights of the weak are safeguarded is a measure of the culture of any community. At the Sixth International Congress on Hygiene and Demography, in 1887, in the medical school inspection section there was proposed a motion, conclusion, and resolution to the effect that the aim of medical inspection is to counteract the injury to the health of children resulting from school attendance and instruction. I proposed an amendment (which was adopted) that medical inspection should work also toward the end of improving the children's state of health. I think it is a suggestion worth considering that, in addition to seeking to advance religious feeling, morals, and knowledge in a child, and in addition to paying attention to the individual child's state of health in connection with school work, the school should take up, as its principal aim, the development of healthy individuals. This would be to the interest of the individual, the family, and the commonwealth.

I have only been able here to refer in a brief way to some few phases of these vast and important subjects. If what I composed months ago is not in every detail up to date, I offer my apologies.

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[1] There were in 1910, 17 clinics and about 153,000 inhabitants.

SOME IMPORTANT ASPECTS OF EFFICIENT MEDICAL INSPECTION OF SCHOOLS—A SCHOOL MAN'S VIEW.

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The beginning of medical inspection of schools in this country was in Boston in the year 1894. It was for the detection of cases of contagious diseases in the schools, in the interest of better protection of the public health. Other cities quickly followed suit. At the present time, 20 States have State laws relating to medical inspection of schools, and over 400 cities have medical inspection in more or less successful operation.

The broadening of the scope and purpose of medical inspection of schools is as striking as its geographical extension. To its work with infectious diseases was quickly added the work of caring for skin diseases and uncleanliness. Next it began the examination of children for the discovery of defects and infirmities that retard development and reduce the school efficiency of children. Soon it essayed the task of examining all pupils, not only for the purpose of diagnosing seriously defective conditions, but also for the purpose of charting, as it were, the physical values of all pupils. Coincident with this work of examination and investigation has developed an appreciation of the real significance of medical inspection. Its true mission is seen to be the general upbuilding of the health of children in school. Medical inspection is fast becoming health supervision.[1] It is formulating a comprehensive program for the conservation of the health and efficiency of children in the schools. It is organizing agencies not only to remedy defects and to effect cures, but also to improve the hygienic conditions of school life.

It is the purpose of this paper to illustrate some aspects of efficient constructive work.

Medical inspection has pretty fully solved the problems incident to the control of communicable diseases in the schools—both infectious and parasitic. In either case competent and frequent inspection is of primary importance. The daily inspection, by doctor or nurse, of suspected cases, referred by the teacher, must be supplemented by a careful weekly inspection of all pupils. This insures immediate detection of all cases of disease in the schools. Prompt disinfection of classrooms, and a sane policy of exclusion and quarantine, almost always prevent epidemics of disease.[2] In Orange, N. J., where there is weekly inspection of all pupils by the school nurse, "no schools have been closed on account of an epidemic of disease" in the two years during which medical inspection has been in force.

In Newark, N. J., in 1910–11, the number of school buildings quarantined was 50 per cent less than in the preceding year. This was coincident with the increase in the medical inspection force that made possible a monthly inspection of all pupils. The method commonly in vogue, of having the medical inspector inspect irregularly only such pupils as are referred by teachers, is insufficient. A careful inspection of all pupils as frequently as once a week is required.

The function of medical inspection is to keep pupils in school, not to turn them out, but to keep them in school without injury to others or to themselves. In the early days of medical inspection wholesale exclusion of children with vermin and parasitic skin diseases was the rule. The common practice now is to reduce exclusions to the minimum.

In Philadelphia, in 1904, 7,071 exclusions were reported for pediculosis and 2,486 for scabies, ringworm, and impetigo; in 1910 exclusions for the same causes were 1,644 and 973, respectively. Every report I have examined shows a decrease in pediculosis, scabies, ringworm, and impetigo. This commonly means that only flagrant cases are excluded. All mild cases are taken care of by the school nurse.

Newark is a good example of effective handling of this part of the work of medical inspection. The nurse "has entire charge of all cases of pediculosis and uncleanliness," and she also looks after the treatment of "ringworm, scabies, favus, impetigo, molluscum contagiosum, conjunctivitis, infected wounds, and contusions." Emergency cases she treats at the school. She directs the home treatment. A notice is sent to the parent when treatment is necessary. If attention from a physician is not required, a "direction and prescription slip" is sent.[3]

She keeps watch of each case. If home treatment is not attended to, she goes to the home and instructs or exhorts the mother, as the case may require.

In 1910–11 the nurses' report shows that 6,212 cases of pediculosis were treated, with 619 exclusions; 2,304 uncleanliness, with 40 exclusions; and 35,976 cases of the eight diseases named above, with only 40 exclusions. Newark is typical of a considerable number of cities that are handling this part of medical inspection in such a way as to hold in school most of the children who are suffering from these minor affections, while at the same time improving their physical condition. Exclusion is resorted to only in cases so flagrant as to be a menace or a nuisance.[4]

In all places where medical inspection is progressive, provision has been made for the physical examination of pupils. This begins as a special examination of pupils who obviously have " defects that retard school progress." This is followed by a demand for an annual examination of all pupils, the examination to include not only the detection of defects, but also to serve as a " record of growth and development." In Milwaukee, Rochester, and other cities " an attempt is made to examine every child annually." This ideal generally is not realized because of the insufficient force in the medical inspection service. In New Jersey a State law requires that in every school district " the medical inspector shall examine every pupil to learn whether any physical defects exist, and keep a record from year to year of growth and development." This contemplates an annual examination. Several New Jersey cities are working toward this end. In Newark it is required that " a physical examination shall be made of every new pupil when enrolled, and, as soon as possible, of every pupil in school. About three-fifths of all pupils were examined last year." Trenton reported the examination of nearly all in 1910–11. Orange, N. J., reports that in 1909–10 and 1910–11 " practically every public school child below the high school was examined." In Canton, Mass., where a nurse is the medical inspector, there is an annual examination of all pupils.[5]

The scope and manner of the Orange examination are as follows: " Each eye is tested separately, using the Snellen chart at 20 feet. Presence of blepharitis, iritis, conjunctivitis, or any other affection of the cornea is noted. Each ear is tested separately by whispering at 20 feet. The presence of a discharge from either ear is watched for and noted. Defective teeth, adenoids and enlarged tonsils, and an enlargement of cervical glands are noted. The general condition of nutrition, and any deformity of the spine, the chest, or extremities are recorded, and when necessary an examination is made of heart and lungs." This examination is satisfactory, except that it neglects measurement, of height, weight, and lung capacity—which measurements are essential to a " record of growth and development." Trenton, Newark, Rochester, Milwaukee, in fact, most cities that give a physical examination, include such measurements. The Rochester examination includes also " mentality."

An adequate permanent record is necessary. The card should contain not only the examination data for each year of the school course, but also the essential facts in regard to the child's home environment, history of illness he may have had, summary of his school record (attendance, conduct, effort, profficiency), and (on the back of the card) diagnoses of any infirmities found and recommendations and results.

Dr. Barth, of Milwaukee, states that this record card goes with the child. so that "whenever a child is placed under a new teacher she is thereby informed of any defects the child may have." She will place the child in the room under conditions as favorable as possible for success in his school work. Dr. Goler, of Rochester, contemplates a broader use: "The card is designed to accompany the child from grade to grade, and is to be presented to the issuing officer for work permit if the child wishes to go to work; otherwise, it is intended to follow the child into the high school." It is a "certificate of physical fitness to enter high school or college." Such a physical record, paralleling the school record, serves, in many cases, to interpret the school record. It is also an index of the physical education needs of individual pupils. Again, these records, studied collectively, may be an index of the hygienic conditions of the school. If, e. g., the records were to show a progressive frequency of any defect or disability for which any phase of the school procedure or environment might be responsible, investigation should be made. There are doubtless some subtly unhygienic factors in the ordinary methods of instruction.

The primary object of physical examinations is the discovery of infirmities and defects. The object of the discovery, however, is that they may be remedied. A notice to the intelligent and solicitous parent that the child probably needs medical attention is sufficient. But the majority of defective children are children of poverty. Poverty is the matrix of disease and defect. Ignorance is their nurse. The indifference of parents is born of ignorance. Medical inspection must do battle with poverty for the health and happiness of helpless childhood. Its weapons are persuasion and instruction. Its only compulsion is the moral compulsion exerted by wise and sympathetic and persistent persons. In this field success depends almost absolutely upon the school nurse.

An experiment was made in Philadelphia in 1910 in which "eight schools of about the same character and equipment were selected. In four of these school nurses worked regularly; in the other four, not. At the end of the first half year it was found that in the schools where nurses worked results were obtained in 90 per cent of the recommendations of the medical inspectors; in the four schools that had no nurses results were obtained in only 25 per cent of the recommendations." In Newark, after one year, with a wholly inadequate number of nurses, Dr. Holmes was able to report "an immediate and large increase in the number of cases treated and a reduction of retardation due to physical infirmities."

Statistical comparisons of the relative efficiency of medical inspection systems are practically impossible, because of the lack of uniformity among such systems, both in the kind of data presented and in the method of presentation.[6]

The most adequate report in this respect which I have found is that of the medical inspector of Orange, N. J. (1911). The form of statement is unsystematic, but certain important facts are given for the two years during which medical inspection had been in force. The total number examined, number found normal, number abnormal, number sufficiently abnormal to need treatment, number that received treatment (proper care and attention), number that neglected or refused treatment. Summarized in tabular form, these figures show at a glance the measure of success and failure in improving the health of the defectives:

Year.	Number examined.	Normal.		Abnormal.		Recommended for treatment.					
								Treated.		Not treated.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1909-10...	3,606	2,481	69	1,125	31	461	13	323	70	138	30
1910-11...	3,808	3,500	92	308	8	196	5	102	52	94	48

It is shown that in the first year 70 per cent of those needing treatment "received proper care and attention;" that in the first year 13 per cent of all the children examined (which was all in school) needed treatment, but only 5 per cent in the second year; and that, whereas at the end of the first year 138 pupils needed treatment who had not received it, at the end of the second year there were only 94. The report states that nearly one-half of these 94 were cases left over from the preceding year, "children over whom we shall have to work for years until the parents are educated to the point of acknowledging their children's defects or until their financial condition allows them to consult their own physician instead of going to a dispensary as a charity patient." These cases are evidently not regarded as "closed." They are to be pursued until properly treated. The problem is not medical, but social and educational.

One or two crude comparisons are possible. The Newark report for 1911 gives the following data:

Year.	Number examined.	Normal.		Defective.	
		Number.	Per cent.	Number.	Per cent.
1909–10	8,483	2,580	30.5	5,903	69.5
1910–11	24,310	9,356	38.5	14,954	61.5

The percentages of normal and defectives may be compared with Orange:

Year.	Per cent normal.		Per cent defective.	
	Orange.	Newark.	Orange.	Newark.
1909–10	69	30.5	31	69.5
1910–11	92	38.5	8	61.5

It is to be noted that, whereas in Orange all the public school children were examined, in Newark only one-fifth were examined in the first year and about one-half in the second year. This means that those who were examined were for the most part children who were suspected of defect. This accounts in large part for the disparity in the percentages of normals and abnormals. On the other hand, the tripling of the number of examinations in the second year means that the examination was not limited to probable defectives, but in some schools included most, if not all, of the pupils. This alone would suffice to account for the reduction in the percentage found defective. This would imply, of course, that a relatively small number of those found defective in the first year had received attention. Even if we should assume that all of the children examined in the second year were suspected of defect and that the other one-half of the school enrollment were probably normal, we could then only reverse the figures for normal and abnormal, 61.5 and 38.5 per cent, respectively, instead of vice versa. The disparity in the number of abnormals would still be striking—nearly five times as high in Newark as in Orange. Allowing for differences in the social character of the two communities and for different standards of "abnormality," this statistical evidence points plainly to the conclusion that in the one case remedial results were generally secured and in the other case that such results were much less generally secured. In respect to this matter, medical inspection is efficient in the one case and inefficient in the other case.

The important difference in organization is in the relative number of nurses employed. Orange has one nurse for every 2,000 pupils;

Newark has one nurse for every 6,000 pupils. In Trenton, with one nurse for 6,000 pupils (approximately) the significant fact shown by the statistics is, according to Supt. Mackey, that "there are so many cases reported to the parents as needing medical attention that do not receive it." The report of every city where the number of nurses is inadequate tells the same story. The nurse is the live wire, in this part, at least, of the work of medical inspection.

The constructive character of the nurse's work is shown in a statement by Dr. Hoag, of Berkeley, Cal. The nurse showed parents how to construct a cheap sleeping porch; instructed mothers in regard to proper food (she found many children who were drinking from one cup to 3 pints of coffee a day and, in many instances, succeeded in correcting the evil); provided means for medical and dental treatment where parents were financially unable to do so; showed many mothers how to treat minor ailments; frequently found conditions in the home environment that fully explained infirmities revealed in the physician's examination, and, in many instances, adjusted the difficulties. Her intimate knowledge of the relation between home health and school health is invaluable. The following quotation from a letter from Supt. Mackey, of Trenton, is significant, as showing the matured conviction of an exceptionally capable school superintendent:

> The most interesting results of our system of medical inspection, I think, are not to be found in our tables of statistics, but rather in the reports of individual cases and especially in the work of the nurses in the homes and in mothers' meetings in their respective districts. For example, a nurse at a mothers' meeting gave a demonstration to show how to bathe and care for a sick child. One of the mothers at this meeting learned from the demonstration how to take care of her children when three of them were down with scarlet fever, and it was the report of the family physician that the children owed their recovery entirely to the skill and care of the mother. One of our nurses has given in several neighborhoods a demonstration of bathing and feeding a baby. The meeting was attended by 35 or 40 Italian mothers, each with one or two very small children, and it was inspiring to note with what intense interest they watched every movement of the nurse as she undressed, bathed, and dressed a baby and showed how to prepare and take care of its milk. Everything was explained also to these mothers by an interpreter. Perhaps even more important work has been done by the nurses in their visits to the homes of the children—the conditions of squalor and filth that have been remedied, and the children cleaned, cured, fed, and sent in decent condition to school.

Plainly, medical inspection as a "comprehensive program for the conservation of the health of children in school" is social and educational. Two important factors in the realization of the program are: (1) The organization of systematic cooperation with such existing social agencies as hospital and dispensaries. (2) The development, either within or without the school system, of new social and educational agencies, as are shown by experience to be necessary.

In medical inspection reports, there is constant reference to the cooperation of clinics, dispensaries, etc.:

> The nurse provides means for attention to medical or dental conditions that would otherwise be neglected. Children needing the attention of a specialist, and unable to pay for it, are taken by the nurse to a public clinic.

Dr. Barth, of Milwaukee, states that the agencies by which defects are remedied are the—

> dispensaries, children's free hospital, and the free dental clinic run in connection with my office. The board of school directors have also placed a fund of $500 at my disposal for the purchase of eyeglasses for children of indigent parents. Practically all the doctors of the city are willing to treat children free of charge, if it is so recommended by the department.

In a published statement Dr. Barth states that—

> the department maintains a close relationship with all the charitable and relief organizations of the city and through their agency is enabled to satisfy many little hungry mouths and clothe many shivering bodies. Bad housing conditions are reported to the health department for investigation. Cases of parental neglect or abuse are taken up with the juvenile court. Thus the department comes into touch with all civic problems of health and happiness. Its opportunities for doing good are enormous.

The Philadelphia report for 1910 shows that of 142 children found suffering from malnutrition, 89 were sent to the country through cooperation with the appropriate charitable agency. In almost every report I have examined, cooperation with the antituberculosis association is reported. In many places free dental clinics have been established by the dental association, at the instance of the departments of medical inspection. In Milwaukee and Philadelphia, though maintained by the dental societies, the clinics are located in the city hall, and have an official connection with the department of medical inspection.

What is needed in every city is organized systematic cooperation, so that time and energy may not be wasted.

It is beginning to be seen, however, that real economy of time and effort demands that much of this work be done within the school. It is already common for the school nurse to take care of most of the minor ailments. This work needs to be extended and systemized. Dr. Holmes, of Newark, has aptly stated the case for a general school clinic: A large majority of the public-school pupils who are found suffering with diseases and defects receive free treatment at the free clinics which are attached to hospitals. Frequently, in such cases, the parents are able to pay, but the hospital has no way of knowing. The hospital clinics, too, are generally held in school hours, so that going to the clinic means loss of school time. As the nurse frequently has to go with children, the waste of her time is considerable.

Finally, and most important, the treatment of cases in school by the nurses has grown to such proportions as seriously to interfere with classroom inspection and home visiting. This is a grave misfortune, as it is only through following up the serious cases in the home that results are obtained after recommendation by the physician. Furthermore, much of the nurses' time is wasted, in this follow-up work, with parents who delay and shilly-shally, but who would permit immediate action if a clinic were connected with the school. There should be a properly equipped school clinic, open daily, except Sunday, from 3 to 6 p. m., and conducted by the medical-inspection corps. Only school children should be treated. Admission to the clinic should depend upon a certificate stating that the pupil had been referred by a medical inspector for treatment, and that the nurse had visited the home, and had found that free treatment was necessary and right. Such a clinic would effect an enormous saving of time for nurses and would eliminate pauperism—for the essence of pauperism is not the acceptance of free service when there is no other way; it is the seeking of gratuities when not in need of them. "In our large cities it is ever becoming more and more difficult for the child of the poor to grow to manhood or womanhood with a healthy normal body. In my judgment, the public school and its force should be ever mindful of the physical health and growth of the children in its vicinity."

Dr. Holmes speaks as though he expected this plan to be adopted at no distant date. There are symptomatic approximations in a number of places. The school physician in Berkeley, Cal., has a "consultation office," open three afternoons a week. Parents are urged to consult. Thorough examinations are made, parents are fully advised, and arrangements are made for treatment, if parents are unable to pay. In New Jersey, city councils are authorized, by State law, to appropriate not to exceed $5,000, to maintain a dental clinic for the schools. Several cities have established clinics under this law. In Philadelphia, the Bureau of Health and Charities maintains a division of ophthalmology. Most of the work is with school children. Such actual achievements suggest that the school clinic is not an "iridescent dream."

Another important field of work is opening to medical inspection—the supervision of the education, in its medical aspects at least, of the various classes of defective children for which special provision is fast being made in public-school systems. Medical inspection is initiating and directing the open-air schools for tuberculosis and anemic children in many cities. Dr. Holmes, of Newark, makes a logical plea for special classes for children suffering from trachoma:

> During the year 1909–10, one hundred and seven cases of trachoma were found in the public schools; in 1910–11, one hundred cases. This meant indefinite exclusion until these pupils were cured. Such loss of attendance is a needless hardship. If a special room were provided for them, they could, with few exceptions, continue their education while under treatment.

Newark, Milwaukee, Philadelphia, and other cities report responsibility for the examination and classification of backward and feeble-minded children. Dr. Holmes's statement will serve as an example:

> The board of education established last year five classes for feeble-minded pupils. The selecting, classifying, and diagnosing and prognosticating of such cases fell to some extent on the department of medical inspection. There is great need of care in selecting, classifying, and diagnosing the cases, as it was found that these special classes were composed of a great many hopeless idiots who could not profit by any instruction and were surely institutional cases. Examination of all the pupils in these classes showed a number of physical defects, which, when removed, improved the comfort and prognosis of these pupils.

In Milwaukee the supervision of special classes for the blind and the deaf, at least in its medical aspects, rests with the department of medical inspection.

The development of this kind of work means the addition of specialists to the medical-inspection corps. Milwaukee, Rochester, Philadelphia, and other cities report the employment of specialists.

The development of medical inspection of schools is steadily in the direction of constructive hygiene. The facts and examples I have cited are illustrations of important factors in the organization of a program of health conservation in the schools. The most significant things in this program are seen to be not diagnosis, as important as that may be, but the development and organization of the social and educational agencies.

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[1] Mr. L. Rapier, of New York, has recently made a study of medical inspection in 50 cities of the country. He has personally visited 25 cities. The results of his investigations are shortly to appear in a book. He has published two brief but important papers: "Medical supervision of schools," in American Education, April, 1912; and "Tentative standard plan for the medical supervision of schools," in School and Home Education, May, 1912. He criticizes constructively the administration of medical inspection. His forthcoming volume should exert a formative influence in the reconstruction of medical inspection.

[2] Exclusion of pupils is sometimes overworked. The Report of Superintendent Verplanck, of South Manchester, Conn., 1911, suggests such a case.

[3] All such "home" notices and instructions must be couched in simple and untechnical language. School physicians frequently seem not to understand this.

[4] The State law of New Jersey provides that a parent or guardian who refuses or neglects to carry out directions in regard to contagious disease or cleanliness may be punished as a "disorderly person."

[5] See School Inspection in Small Towns, by Dr. A. Cabot. Boston Med. and Surg. Jour., May 4, 1911, Vol. CIXIV, No. 18.

[6] Most of the statistical reports are for the purpose of exhibiting the amount of service performed, not the results secured. Where results are shown, it is on the basis of the number of different ailments treated rather than the number of children improved.

WHAT MEDICAL INSPECTION OF SCHOOLS CAN DO FOR THE TEACHER.

HELEN MACMURCHY, M. D., Toronto, Canada.

What the teacher thinks about the medical inspection of schools makes a great difference to the success of any attempt to establish this state partnership between education and medicine. If the medical inspection of schools is to be really useful, we must, first of all, find the right doctor specially qualified to take charge of the work. Then that work must be organized. And it must stand the test of daily experience. We must be able to see that the children have better health and make better progress. Otherwise, Cui bono? Who is the judge of this? The teacher. This teacher, who is at once our help and our judge, leads the strenuous life.

"Most readers," says the manuscript of Mr. Pattieson, "must have witnessed with delight the joyous burst which attends the dismissing of a village school on a fine summer evening. The buoyant spirit of childhood, repressed with so much difficulty during the tedious hours of discipline, may then be seen to explode, as it were, in shout and song and frolic as the little urchins join in groups on their playground and arrange their matches of sport for the evening. But there is one individual who partakes of the relief afforded by the moment of dismission, whose feelings are not so obvious to the eye of the spectator, or so apt to receive his sympathy. I mean the teacher himself, who, stunned with the hum and suffocated with the closeness of his schoolroom, has spent the whole day (himself against a host) in controlling petulance, exciting indifference to action, striving to enlighten stupidity, and laboring to soften obstinacy; and whose very powers of intellect have been confounded by hearing the same dull lesson repeated a hundred times by rote, and only varied by the various blunders of the reciters. Even the flowers of classic genius, with which his solitary fancy is most gratified, have been rendered degraded, in his imagination, by their connection with tears, with errors, and with punishment; so that the eclogues of Virgil and odes of Horace are each inseparably allied in association with the sullen figure and monotonous recitation of some blubbering schoolboy. If to these mental distresses are added a delicate frame of body and a mind ambitious of some higher distinction than that of being the tyrant of childhood, the reader may have some slight conception of the relief which the solitary walk, in the cool of a fine summer evening, affords to the head which has ached and the nerves which have been shattered for so many hours in plying the irksome task of public instruction." (Walter Scott, in Old Mortality.)

If we are to understand what medical inspection of schools can do for the teacher, we must follow the example of that ancient Hebrew statesman and sociologist who came to Tel-abib to visit the children of the captivity. "I sat where they sat," he says.

To-day the teacher is still "stunned with the hum" of the schoolroom and suffers its "closeness." Medical inspection must improve schoolroom air.

As for "shattered nerves," we, who know so much about the neurasthenic and the psychasthenic, realize that preventive medicine has yet to win the victory for those unhappy beings whom we class as nervous patients.

We must show teachers that medical inspection can do something for them by lessening strain, by providing outlook, and by giving the teachers the sense that we are "all with them," that we are all behind them, that we are thinking of providing a "wander year" and better conditions generally for them and their scholars, so that their heads may not ache so often nor their nerves be shattered so frequently. Besides, every teacher meets, sooner or later, the stupid, the dull, the backward, and the sick. They are our peculiar care. The stupid may have adenoids, the dull may only be dull of hearing, the backward may be really feeble-minded, and the sick may be sources of infection to the teacher as well as to the pupils. We doctors know what to do for these pupils. They are heavy burdens to the teacher. Send them to us, for we know what to do for them and how to do it, and we are now appointed by the state and the education authorities for that purpose.

We need the teacher, besides, as an active ally. The school child may be a powerful influence in sanitary reform, as the Hon. Joseph Chamberlain showed in 1894. As a sanitary reformer, the school child, by his influence at home, can get more rapid and more permanent results than any of us. The school doctor, by lectures, photographs, conversations, and personal contact with the teacher, can add immensely to the knowledge and the resources of the teaching profession, and hence to their sphere of influence in the community. We can not ourselves make the school child a sanitary reformer, but we can do it through the teacher, and that is a benefit to the teacher as well as to the community. Knowledge is power.

Light in the schoolroom is almost as important as air. Look at the windows. Probably we all know of instances where the poor teacher suffered, and suffered far more than the pupils (for the pupils stay one term in the room, but the teacher stays for years in the room), from insufficient and improper lighting. Ground glass is an abomination to the eyes. I know a teacher who had to struggle for months, yes, even years, before she could get it taken out for her. The economical architect had put it in to save the cost of blinds. The school board saved the cost of the blinds, but who paid for the damage to the teacher's good eyesight? The principal did all he could. The school board met once a month, but it had a lot of business, and large bodies move slowly, especially when it is not the school board's own eyes and head that are aching. Finally, the government inspector came along. The teachers and the principal appealed to the inspector. In due time the inspector reported to his government department of education. The department, in the course of time, sent a copy of this report to the board. The board sent the report to the management committee. The management committee noticed what the inspector said about the ground glass. They recommended the removal of that glass. The board received and approved the report. The work was done the next summer holidays. That was the best time—record time.

But now it would be quite possible to have the glass removed in as many weeks as it formerly took years, because the medical inspector of schools has been appointed to deal with such matters.

The greatest benefits we receive from anything or anybody are not so easily tabulated as are the least benefits. The greatest calamities are those that come unrecognized by ourselves—such as atrophy and hardness of heart. And there is an isolation in the teaching profession and an indefinite and often unrecognized sense of disappointment and limitation that steals in upon the teacher's soul as he or she sees, year after year, the graduates for whom the teacher has done so much enter into the Canaan of a new and wider existence in the great world for which the schoolroom world is only a preparation. In one sense that Canaan of the great world is not for the teachers, as it were. They have to stay in the schoolroom and begin to do it all over again—to drill that six times 9 are 54, and that the genitive of *mensa* is *mensæ*, and that the Nile rises in the Victoria Nyanza, and that Columbus discovered America in 1492, and the freezing point of water is 32° F., and how to solve a quadratic equation, and how to cross the asses' bridge, and how to write a composition, and what the Greek Kalends were, and what Lady Macbeth said that she should not have said, and all the rest of it.

When you have taught these things 200 times you can not save your soul alive by teaching them again. You need some sense of comradeship with your equals, and some community of interests—some recognition of the higher references of life which children (except occasionally by direct inspiration of God) can not give you. We do not claim that the call to the doctor to stand beside the teacher can accomplish all this. But it can help, for the doctor grasps the hand of the teacher as an equal, and says, "What can I do for you?"

And so, while being school doctors, we can certainly bring the teacher better health by giving protection from infection and impure air diseases and from eye strain caused by bad lighting, while we can make the teacher's work easier by improving the child's sight and hearing and breathing, while we can find the mentally deficient child among a hundred or a thousand and relieve the class, the teacher, and the nation by pointing out the absolute necessity of the special class and permanent care in after life for the mentally deficient—though this one thing alone would justify medical inspection of schools—yet the greatest thing we can do, as school doctors, is to remind the teacher and the world that the schoolroom, next to the home, is the most important place in the world. Out of it issues that stream of life which determines national character and national destiny. Those who deal with the making of human beings are doing the greatest work in the world.

The greatest thing we can do for the teaching profession is to help people to see its value and importance, so that better recruits shall enlist in that army, and that we shall pay them by the coin of the realm, and by that coin of public respect, regard, and influence which is more precious than gold. We may thus show a little more light on the larger vision of human life and render the schoolroom walls capable of expansion until the interests and fate of the world shall be thought of there. We may so help teachers to do their best for their pupils in the most scientific way that the tired heart takes courage because a new helper has come, that the weary hand grasps the task anew because greater accomplishment is possible with less effort than of old, and that the eyes, grown dim with too close scrutiny of small things, are lifted up to look at the distant horizon, where dawns a better day for the school and for the world.

A FOLLOW-UP SYSTEM IN MEDICAL INSPECTION.

Dr. Thomas A. Storey, of the College of the City of New York.

Active, aggressive health is the most important human resource. This is true because of the determining influence of health upon the success of every human enterprise. It is of supreme importance in its relation to the quality of all physical efficiency and to the value of all mental productivity.

On account of this fact any phase of educational method which develops health intelligence and health habit in human beings is of very great educational and practical importance. This importance is now very generally recognized in our public schools and colleges. Unfortunately, we are far from a unanimous decision as to what is the best method of instruction along these lines. Too much of our instruction is of the sort that stimulates no response in terms of practical application. Too little of the hygiene learned in our schools is ever used by the boys and girls in their homes. Too little of such hygiene ever becomes habit.

In the department under my supervision we have attempted to secure a method of instruction in hygiene which will develop permanent health habits in the individuals that come under its educational influence. One phase of our work includes medical inspection. We do not like to call this part of our work "medical inspection." We prefer to make it and call it "individual instruction in personal hygiene." In this scheme medical inspection becomes a part of our method of securing information concerning the hygienic needs of the individual and a basis on which the individual may be given advice bearing upon his personal health problems.

Our methods of medical and hygienic examination have been described elsewhere and need not be described here. The important feature in our plan lies in our method of following up our instructions to the individual. All advice and instruction given during medical and hygienic examination is followed up within as short a time as is reasonable. If the individual is found affected by some communicable disease which is a menace to the health and hygiene of his associates, he is required to remove the complaint or leave school. If the individual is found suffering from the influence of remediable incapacitating physical defects, the fact is brought to the attention of his parent or guardian. This notice must be recognized. The pupil must return with evidence that the incapacitating defect is being treated, or he must bring a note from his parent or guardian stating what he plans to do.

Failure to bring such a communication is handled as a matter of discipline. The boy is debarred from all classes until he brings in this note or until he brings in evidence that he is under treatment.[1] If the parent writes that he does not propose to do anything with reference to a condition or a defect that has been reported to him, the fact is noted and the boy is relieved of any further obligation at that time. This is not done, however, until every reasonable effort has been made to place the hygienic importance of remediable treatment before the boy and his parents. The regular examination is repeated each half year, so that such a defect comes under observation twice a year for five years, and the need for treatment is urged at least as many times during that period.

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[1] The department will undertake no treatment other than strictly emergency treatment. No physician on the departmental staff has ever secured a private student patient through these examinations.

As a matter of fact, the percentage of parents that refuse to secure treatment is very small. For the year ending June 1, 1911, the number in this class was seven-tenths of 1 per cent, and for the year ending June, 1912, it was eight-tenths of 1 per cent.

The routine involved in following up this instructional advice may be outlined as follows: At the time of his examination each boy is seen by a member of the staff, with all the results of his preceding examination or examinations recorded on cards made out for that purpose. The instructor then goes over the boy's record with him and advises him as to what has to be done and what ought to be done for the improvement of his health habits and his physical condition. As he proceeds with this advice, the instructor makes out a "conference card." This card contains the boy's name, his address, his class and section in the school, frequently his schedule of recitations, and a record of each "diagnosis" for which advice has been given.

The boy himself is given a card which contains a record of the things to which his attention has been called, and a memorandum of the date or dates on which he has been directed to return for conference. Finally, he is given a card containing a communication to his father, with a request for a record of his physician's or dentist's examination and treatment on the back of the same card.

These various cards are so printed as to require a minimum of clerical work in filling them out.

After the boy has received this instruction the conference card is filed away. When the boy returns for conference his conference card is drawn and on it is recorded the fact that treatment has been promised, secured, or refused. If the case can not be closed in this way at this conference, a record is made of the fact that the boy reported, and he is given a new date for subsequent conference.

The file of conference cards is gone over regularly every day or two. All deliquent boys are warned that they should report as directed. This "warning" is accomplished in one of two ways: Either the boy is seen personally in the classroom, or a letter is sent him, addressed to his home. In the latter case, the letter reads that the boy will be debarred from all classes unless he reports to the central office of the school on or before a certain date with a communication from this department stating that he has satisfactorily followed directions. If the boy then fails to report, he is debarred from all classes, and can be reinstated only on recommendation from the department of hygiene.

In those instances in which treatment is promised the cases are followed up at longer intervals in order to secure a record of what is done. By means of this plan the boy is reminded of his promise at fairly frequent intervals. The success of this follow-up system during the year ending June 1, 1912, may be seen in the following statistics:

	First term.	Second term.
Boys given instructional advice	1,051	936
Diagnoses followed up	1,542	1,409
Conferences necessary to follow up all cases	2,244	1,925
Diagnoses recorded as "Under treatment":		
Number	73	158
Per cent	4.7	11.2
Diagnoses recorded as having "Secured treatment":		
Number	1,298	1,093
Per cent	84.1	77.5
Diagnoses recorded as having "Refused treatment":		
Number	11	10
Per cent	0.7	0.8
Diagnoses recorded as having "Promised treatment":		
Number	108	102
Per cent	7	7.2
Left college:		
Number	40	40
Per cent	3.1	2.7
Parents refusing to secure treatment	9	8
Individuals warned	328	290
Individuals debarred	71	92
Individuals reinstated	67	85
Individuals that remained debarred	4	7
Dentists consulted privately	273	256
Physicians consulted privately	189	139
Opticians consulted privately	22	16
Dental clinics attended	3	4
Hospitals attended	24	14
Students securing private dental service	320	310
Students securing private medical service	204	147
Students securing the service of opticians	15	18
Students securing free dental service	8	13
Students securing free medical service	4	5
Students securing free clinical service (dental)	....	3
Students securing free clinical service (medical)	10	11
Percentage of students securing private services	96	93
Percentage of students securing free services	4	7
Total number securing private services	539	475
Total number for whom home treatment was sufficient	490	429
Total number securing free settlement	22	32

These statistics justify the following conclusions:

First. Our medical inspection is effective. It is securing the repair of physical defects, and it is correcting unhygienic conditions, in over 90 per cent of the cases under observation. This plan of individual instruction in personal hygiene is improving the physiological efficiency of at least a thousand boys every half year.

Second. Our plan of individual instruction in personal hygiene has met with the support of the parents of practically all our boys. No system can endure without such support.

Third. It is safe to expect that this continued personal relationship, extending throughout the high-school period, and covering the first two collegiate years, will develop permanent habits of personal health control in many, if not in most, of the boys under our supervision.

DISCUSSION.

Dr. CHANCELLOR. We have heard this morning a deal about the inspection of city schools. I have visited the schools of practically every large city in the land. Almost no States do anything for their rural schools. We may go after the 60 per cent of children in rural and small-town schools by State legislation and county authorities. Some States have made small beginnings.

Geo. J. Holmes, Newark, N. J.: I agree with Dr. Baker that Dr. Storey's plan of following up is excellent, but that it does not produce such excellent results when applied to public school pupils. The only excuse for medical inspection is that it will correct physical defects, improve the health of pupils, and the sanitation of school buildings. The school nurse is the most valuable agent in correcting defects. It is she who follows the pupil to the home and pleads with the parents to obtain treatment.

There is no part of physical examination that a well-trained school nurse is not fit to carry out effectively, except the examination of the heart and lungs.

Personally I have not a very good opinion of the part-time, poorly paid physician acting as medical inspector.

It must be remembered that free treatment, if offered at all to public school children, must be offered to rich and poor alike; their parents are both taxpayers.

THURSDAY MORNING, SEPTEMBER 26, 1912.

DIE SCHULÄRZTIN AN DEN HÖHEREN MADCHENSCHULEN, EINE SOZIAL-HYGIENISCHE FORDERUNG.

Dr. Helene Friderike Stelzner, Schulärztin an den Charlottenburger höheren Mädchenschulen.

Zunächst möchte ich erwähnen, dass der Titel meiner Ausführungen nicht so feministisch gemeint ist, wie es vielleicht den Anschein hat. Er könnte ebensogut lauten "Der Schularzt an den höheren Lehranstalten," wenn er nicht einige wenige Betrachtungen und Beobachtungen enthielte, die speziell aus der Verbindung des weiblichen Arztes mit der Mädchenschule hervorgehen.

Nachdem die Institution von Schulärzten für die Gemeinde-Schulen allgemein unter fühlbarem Mangel an Begeisterung der beteiligten Kreise, der Lehrer und der Eltern sich vollzogen hatte, ist man jetzt nach etwa 15 Jahren soweit nicht mehr begreifen zu können, wie es ohne diese Einrichtung gehen könnte. Nachdem man in den verschiedenen Staaten langsam und zögernd dazu geschritten ist, Schulärzte auch an den höheren Schulen anzustellen, scheint es nicht unwichtig, aus diesen ganz jungen Erfahrungen heraus die Sachlage zu beleuchten, um die sozialhygienischen Gesichtspunkte herauszuschälen und ein ev. Vorwärts in der Angelegenheit anzustreben; denn es handelt sich dabei zweifellos um ein internationale Kreise treffendes Bedürfnis, dem zunächst nur in wenigen Staaten und auch da nur teilweise entsprochen worden ist. Und wenn z. B. bei uns in Grossberlin die neuerbauten Gemeindeschulen mit ihren Bade-, Brause-, and Waschgelegenheiten, mit ihren gut ventilierten Räumen, ihren blühenden Pflanzen und lustigen Aquarien wahre Tempel der Hygiea vorstellen, so glaubt man in den höheren Schulen damit weniger üppig sein zu dürfen, weil die Kinder angeblich das Alles zu Hause haben. Aus derselben Erwägung heraus hielt man auch den Schularzt an den höheren Schulen mehr für einen Luxus- und Repräsentationsgegenstand. Welches Material stellen nun eigentlich die Schüler höherer Lehranstalten dar? In Wirklichkeit sitzen sie durchaus nicht immer in dem häuslichen hygienischen Paradiese, das man für sie anzunehmen scheint, und darum soll auch der Aufenthalt in der Schule, das Schulhaus und alle Schulbedingungen möglichst hygienisch ausgestaltet sein.

In ihren Familien sind häufig gerade nur die Mittel für eine einigermassen standesgemässe Lebensführung vorhanden. Der Arzt wird in dringenden Fällen gerufen; dauernde ärztliche Ueberwachung findet nicht statt. Der Besuch der höheren Schulen wird nur unter Opfern ermöglicht, um ein Herausfallen aus dem sozialen Milieu, in das die Betreffenden hereingeboren sind, zu verhindern.

Dabei sind die Schulschädigungen an sich an den höheren Schulen viel schwerer zu bewertende; Die allgemein höher gestellten intellektuellen Forderungen, die grössere Stundenzahl, die längere Dauer der häuslichen Arbeitszeit, die Erweiterung der Schulstunden durch Musik- und andere Stunden und nicht zuletzt die mit Erwekkung des Bildungstriebes einhergehenden Vergnügugen, die sogenannten Mussestunden, die aber eine geistige Anspannung bedeuten, Lesen, der Besuch von Museen, Theatern, Konzerten, das Hören von Vorträgen u. a. m.

Angesichts dieser Tatsachen erscheint Anstellung von Schulärzten an höheren Schulen dringend notwendig, und es muss Wunder nehmen, dass, soweit es sich um die europäischen Kulturstaaten handelt, dieser Forderung noch recht wenig entsprochen ist. Wie die Verhältnisse in Amerika liegen, hoffte ich hier zu hören. Asien ist uns mit seinen Einrichtungen in Japan jedenfalls voraus. In Ungarn und Bulgarien sollen nach Leubuscher die höheren Schulen mit Schulärzten vielfach versorgt sein. Die Petersburger Gymnasien sind offenbar in vorzüglicher Weise bedacht. Auch Skandinavien tut sich in dieser Richtung bedeutend hervor. Schweden hat vielleicht am längsten Versorgung der höheren Schulen mit Schulärzten eingeführt. Ich erinnere an die schönen Arbeiten von Axel Key, die sich in gleicher Weise mit den höheren wie mit den Volksschulen befassen. In Deutschland ist noch wenig geschehen, und die Schweiz, die sonst in Schulsachen an der Spitze marschiert, hat zunächst, wie ich durch den Züricher Schularzt im Hauptamte Dr. Kraft, erfahre, im Kanton Zürich Anstellung eines Schularztes an der dortigen Kantonalschule, die unseren Gymnasien entspricht, beschlossen. Den ersten Versuch, eine Schulärztin anzustellen, machte Charlottenburg vor 8 Jahren an den höheren Mädchenschulen. Zunächst folgte Hannover, dann Breslau, das bereits 2 Schulärztinnen beschäftigt. Wien ernannte eine Schulärztin an den Wiener Fortbildungsschulen und kürzlich eine zweite an der K. K. Zentralanstalt für Frauengewerbe. Schulärztliche Berichte von höheren Schulen sind im allgemeinen bisher nur wenige[1] erschienen, umfassende von höheren Mädchenschulen noch gar nicht,[2] und wenn ich den Mut habe, mein kleines Material hier zu publizieren, so geschieht es aus der Erwägung heraus, dass dieses ein zwar eng begrenztes ist, immerhin aber den Vorzug bietet, dass es 8 Jahre lang ein und derselben Person zur Beobachtung unterstand. Unter diesen Verhältnissen ist es wohl möglich auch mit kleinen Zahlen zu gewissen Gesetzmässigkeiten und Ausblicken zu gelangen, die allgemeine Wertung haben und bestimmt sind im Gebiet der sozialen Hygiene einen Platz auszufüllen. Liegt doch der Nachdruck der Schulgesundheitspflege bei höheren Schulen ganz besonders nicht in der schulärztlichen Versorgung des Einzelnen, sondern in den dabei zu Tage tretenden volkshygienischen Forderungen.

Mein gesamtes Material setzt sich zusammen aus den Schülerinnen zweier bereits vor 8 Jahren, als ich meine Beobachtungen begann, fertig aufgebauten, zweier sich während dieser Zeit aufbauenden höheren Mädchenschulen und einem angegliederten Gymnasium. Eine fünfte Schule, die ich ärztlich zu beobachten habe, ziehe ich hier nicht in den Kreis meiner Betrachtungen, da es sich um wesentlich andere Verhältnisse, um eine zwischen höhererund Gemeindeschule stehende Mittelschule handelt. Das gesamte bearbeitete Schülermaterial wird durch insgesamt rund 4,500 Schülerinnen im Alter von 6–16, bezw. 18 Jahren dargestellt. Unter diesen wurden 2,622 mit positivem Resultat untersucht; ca. 1,400 davon stellen sogenannte Ueberwachungsschülerinnen dar. Letztgenannte Zahl gibt nicht vollständig die Menge aller erkrankten oder untersuchungsbedürftigen Kinder an, da ein wenn auch geringer Teil der Eltern schulärztliche Untersuchung verweigerte. Die für das Gymnasium Angemeldeten, meist im Alter von 12–14 Jahren, müssen sich allerdings sämtlich einer Untersuchung unterziehen, sodass hier ein kleines, aber übersichtliches Material zusammenkommt. Da stets mehr Anmeldungen vorliegen, als Plätze im Gymnasium vorhanden sind, kann bei den Aufzunehmenden auf den Gesundheitszustand, der durch die Noten I, II, III, gut, mittel, leidlich ausgedrückt wird, insofern Rücksicht genommen werden, als beim Zusammenfallen nur mässiger intellektueller Kräfte mit schwacher körperlicher Entwicklung Aufnahme verweigert wird. Das ist von schwerwiegender Bedeutung für die gesamte Klasse geistig arbeitender Frauen, der auf diese Weise zu früher Invalidität bestimmte Individuen ferngehalten werden, Individuen, denen ein akadenischer Beruf vielleicht einen Zusammenbruch bringen würde, während sie bei einem andern gesund und langlebig bleiben. Gerade die Neuheit der akademischen Frauenberufe zieht eine Menge auch ungeeigneter Elemente an, und Beispiele haben gezeigt, welch' traurigem Schicksal die auf der Bahn Liegengebliebenen entgegengehen. Die Untersuchungsergebnisse an diesen 327 Mädchen ergaben folgendes:

Mit Gesundheitsnote I wurden 63=19 Prozent, mit II 202=62 Prozent, mit III 61=18.5 Prozent bedacht. Eine Schülerin wurde des ausnehmend schlechten Allgemeinzustandes wegen (Herzfehler, hochgradige Kurzsichtigkeit. Wirbelsäulenverkrümmung, Unterernährung) ohne weiteres zurückgewiesen. Mit 18.5 Prozent der III. Kategorie haben wir fast $\frac{1}{5}$ nur bedingt tauglicher Elemente. Bei diesen heranwachsenden jungen Mädchen und dem Zwang der Untersuchung an Kindern, die zum grossen Teil keiner ärztlichen Hilfe bedürfen, war der weibliche Arzt natürlich eine strikte Bedingung.

Der Zustand der übrigen 2,295 Untersuchten machte in 1,396 Fällen Mitteilungen an die Eltern, die als Aufforderung, ihre Kinder ärztlich behandeln zu lassen, gilt, nötig. Diesen Aufforderungen wurde in 85–90 Prozent entsprochen. Zu betonen ist, dass nur diejenigen Eltern schulärztliche Mitteilungen erhielten, deren Kinder weder dauernd unter hausärztlicher Beobachtung standen, noch an den konstatierten Uebeln jemals behandelt worden waren. In den noch übrig bleibenden rund 900 Fällen genügte hygienische Belehrung der Mädchen, Dispense oder Teildispense, Schulanordnungen, etc.

Immerhin sprechen die eben arwähnten Zahlen, aus denen hervor geht, dass ein Drittel sämtlicher Schülerinnen an unbehandelten Uebeln litten, die eine Schuluntersuchung erst aufdeckte, deutlich genug für die Notwendigkeit des Schularztes an den höheren Schulen, besonders aber auch dafür, dass seine Funktionen noch mehr auszudehnen sind.

Welche Erkrankungen vorwiegend in Frage kommen, zeigt die Tabelle A, deren erste Kolonne die prozentuale Beteiligung des Gesamtmateriales an den verschiedenen Erkrankungen darstellt. Diese Zahlen können als zu niedrig gelten, da sich namentlich in den ersten Jahren eine Reihe von Kindern der Untersuchung entzogen. Kolonne II behandelt sämtliche untersuchten Töchterschülerinnen und III die Gymnasialaspirantinnen. IV and V zeigen die Untersuchungsergebnisse des letzten Schuljahres, gesondert nach den Lernanfängern und Schülerinnen aller übrigen Klassen. Wir sehen, dass die Blutarmut in der Form der Oligaemie bei jüngeren Kindern, der Chlorose des Entwickelungsalters bei älteren die höchsten und für alle Gruppen ungefähr gleichen Werte erreicht, nur übertroffen durch die skrofulösen Erscheinungen bei den Lernanfängern, an denen fast die Hälfte der Neueingeschulten besonders in der Form allgemeiner Drüsenschwellungen etc., leidet. Ob gerade diese Zahlen einem geografischen Verbreitungsgebiet entsprechen, an anderen Orten andere sind, müsste erst die vergleichende Schulhygiene lehren. Wenn die Skoliosen im Jahre 1911–12 scheinbar plötzlich von ca. 7 Prozent auf 15.38 Prozent heraufschnellen, so hat dies seinen Grund darin, dass die Stadt auch für die höheren Schulen Einrichtung orthopädischer Turnkurse in Aussicht genommen hat und sich dafür eine Menge Schülerinnen vormeldeten und auch die unbedeutendsten Fälle vorgemerkt wurden. Schwachsinn und Schulunreife kommen naturgemäss nur für die Lehranfängerklassen in Betracht.

Infolge seiner Vertrautheit mit den Schulverhältnissen erkennt der Schularzt den Urgrund manchen Leidens gerade in diesen. Er sieht die Kinder unter ganz bestimmten psychischen und physischen Verhältnissen, die den Eltern und dem Hausarzt fremdbleiben und kann diese in den Kreis seiner hygienischen Betrachtungen ziehen. Er kann, um ein Beispiel anzuführen, beobachten, wie manche Kinder

Sommer und Winter gewohnheitsmässig grosse Mengen Wassers trinken und sich dabei Verdauungsstörungen zuziehen. Er sieht, wie sie mit demselben Erfolg ihr Frühstück hastig und ungekaut verschlingen, schon halb mit Rennspielen beschäftigt oder diesen zustrebend, oder wie sie der äusseren Verwendung des Wassers viel weniger Liebe entgegen bringen, mit schmutzigen Händen essen, etc. Er beobachtet, wie die Lernanfänger auf den ungewohnten Zwang des Schullebens reagieren, welche Schwierigkeiten das Stillsitzen nervösen Kindern bereitet, wie erregend die gehäuften neuen Eindrücke wirken und wie manche geistig geweckten und lebhaften Kinder still und ernst werden unter der Anspannung dem Lehrstoff zu folgen. Das schulärztliche Auge bemerkt weiter, wie die verbrauchte Klassenluft auf den Organismus besonders der grösseren Mädchen einwirkt. Das puberale Weib scheint infolge weitgehender Anaemien gerade gegen mangelhafte Lüftung ganz besonders empfindlich zu sein und mit Kopfschmerzen und Ohnmachten darauf zu antworten, vielleicht um so leichter, je grösser die Schwankungen in der Ventilation sind; denn diese richten sich häufig nach dem Grade des Lufthungers der Lehrkraft. Empfindliche weibliche Lehrkräfte predigen das Abhärtungsregime und lassen soviel Fenster offen als möglich, während gleich darnach ein männlicher Lehrer sich gegen jede Art von Lüftung wehrt.

Das Hauptgewicht der schulärztlichen Tätigkeit an den höheren Schulen liegt in der Beobachtung der soeben eingeschulten Lernanfänger und ihrer geistigen und körperlichen Eignung für die Schule, den vorhandenen psycho- und neuropathischen Besonderheiten und ihrer eventuellen Aussonderung für Wiederausschulung.

Das schulunreife, vielleicht leicht schwachsinnige, auch körperlich noch nicht fertige Kind vor den Gefahren zu früher Ueberspannung der schwachen Kräfte zu bewahren, das ist ein nur dem Schularzt zufallendes Gebiet. Die verschiedenen Kulturstaaten verlangen in einem bestimmten Alter Einschulung. Die Eltern haben kein Interesse daran, das Kind, falls es nicht körperlich ganz besonders elend ist, länger zu Hause zu behalten. Sie sowohl als die Hausärzte sind selten in der Lage zu entscheiden, ob es die für die Schule nötige geistige Reife besitzt. Nun werden diese Kinder viel zu früh auf dem Prokustesbett der Bildung hin- und hergezerrt. Sie gelangen in einen Zustand der körperlichen Schlappheit, der nervösen Ueberreizung und Uebermüdung, der sie ganz unfähig macht, den Schulforderungen zu genügen. Der erste sichtbare Nachteil besteht darin, dass sie nicht imstande sind, den Anforderungen der untersten Klassen zu entsprechen und diese repetieren müssen, der zweite weit schwerere, aber später in die Erscheinung tretende ist der, dass das unfertige Gehirn- und Nervensystem der aufbauenden Kräfte ermangelt und zeitlebens unrüstig bleibt, dass der Gesammtorganismus. zu früh in seinen Leistungen überfordert, eine dauernde Schädigung davonträgt. Vielleicht wird der zartere weibliche Organismus mehr davon betroffen als der männliche. Die leichte Erschöpfbarkeit vieler berufstätiger Frauen scheint auf den Mangel eines gesunden Aufbaus des Gesamtorganismus zu deuten. Diese geistig überforderten Sechsjährigen werden blutarme, nervöse Sechszehnjährige und später jene schlaffen Berufsfrauen, deren Organismus auch die geringste Ueberanstrengung pathologisch beantwortet.

Zum Beweise dafür, dass ohne schulärztlich psychiatrische Begutachtung bei jedem Einschulungstermin eine Reihe Kinder sehr zu ihrem Schaden der höheren Schule zugeführt werden, führe ich einige Zahlen, die ich an anderer Stelle publiziert habe, an. Unter 900 Lernanfängerinnen aus 6 Einschulungsterminen waren 13 Prozent der Gesamtheit psychiatrisch und neurologisch genauer zu untersuchen, 5 Prozent verblieben als für weitere Beobachtung Vorgemerkte bedingungsweise den Schulen, bei 8 Prozent musste im Interesse der Betreffenden Wiederausschulung gefordert werden. Es handelt sich um 52 (5.8 Prozent) leicht Schwachsinnige, die mit 6 Jahren naturgemäss den Schulforderungen noch nicht genügen können und um 20 (2.2 Prozent) schulunreife Kinder, die infolge von Krankheit oder von langsamer familialer Entwicklung oder infolge von allgemeiner Körperschwäche und Nervosität im Gesamtkörperzustande zurückgeblieben sind. Ein Jahr länger in unumstürmten Verhältnissen hat die Entwicklung der Schulunreifen gefördert, bei den leicht Schwachsinnigen verhindert, dass eine zu frühe Inanspruchnahme der Intelligenzfragmente den Intelligenzstand verminderte. Später müssen die Debilen ja häufig doch noch nach Schulen mit niedriger gesteckten Zielen abgegeben werden. Jedenfalls stellt die schulärztliche Tätigkeit an höheren Schulen ein gut Teil psychiatrische Forderungen besonders in Richtung der Schwachsinnigenfürsorge, die von den Eltern ganz sicher nicht geleistet wird. Deren Ehrgeiz will zunächst durchaus nicht zugeben, dass die geistige Entwicklung ihres Kindes hinter der der anderen zurück ist. Auch machen sie gern das gefährliche Experiment, die Kinder durch Nachhilfestunden fördern zu wollen, wodurch sie noch mehr überanstrengt und ausserdem in ihrer Mussezeit verkürzt werden. Aus dem Anfang meiner schulärztlichen Tätigkeit, wo die Eltern häufig nicht zu bewegen waren, ihre Kinder auf meinen Rat auszuschulen, stammt mir die Erfahrung, dass die von nicht Schulreifen in der Schule zugebrachte Zeit absolut nutzlos ist. Von 20 Schülerinnen, die gegen meinen Rat der Schule verblieben, wurde keine regulär versetzt, sodass das erste halbe oder ganze Schuljahr einen absoluten Zeit- und Kraftverlust bedeutet. Neben den vorerwähnten psychisch Unreifen und Defekten finden sich noch eine ziemlich hohe Prozentzahl der Lernanfänger mit Nervosität behaftet, deren Aeusserungen zum grössten Teil auf motorischem, vasomotorischem und auch sekretorischem Gebiete liegen: allgemeine Unruhe, Zittern, Ticbewegungen, Mitbewegungen, gesteigerte Reflexe, asymetrisches Erröten, halbseitiges Schwitzen, dazu solche psychischer Natur: krankhafte Schulangst mit morgendlicher Uebelkeit oder mindestens der Unfähigkeit etwas zu geniessen, Schlaflosigkeit, nächtliches Aufschrecken, Zerstreutheit, Mangel an Konzentration u. a. m. Diese Symptome, andeutungsweise schon vorher vorhanden, verschlimmern sich beim nervösen Kind ganz bedeutend unter dem ungeheuern Eindruck der Einschulung mit seinen zahllosen neuen Reizen, können aber auch beim normalen Kinde Erscheinungen machen. Die Prozentzahl der Nervösen ebbt mit Gewöhnung an die Schule langsam zurück, um später besonders gegen die Entwickelungsjahre hin in anderen Formen aufzutreten.

Der Aerztin steht ganz besonders zu, den Unzuträglichkeiten durch Belehrung und hygienische Winke zu begegnen, welche vorwiegend die Schülerinnen im Entwickelungsalter bedrohen. Der grösste Teil der jugendlichen Grossstadtgeschöpfe leidet an Verdauungsträgheit und dysmennorrhoischen Beschwerden, welche bei vielen jungen Mädchen noch durch das lange und oft unbequeme Sitzen auf häufig nicht passenden Bänken verschlimmert werden. Wenn als letzter Grund dafür auch die Anämie oder vielmehr die Chlorose der Entwickelungsjahre anzunehmen ist, so werden die Beschwerden durch unzweckmässiges Verhalten in der Schule nur verschlimmert. Hier sind schulärztliche hygienische Ratschläge und Aufklärungen über Verdauungs- und Menstruationsvorgänge durchaus am Platze. Ueber beide Funktionen herrschen siegreich teils prüde, teils geradezu abergläubische, teils laienhaft unvernünftige traditionelle Ansichten, empfehlen Schonung, wo sie nicht geboten und Vernachlässigung, wo sie gefährlich ist. Indem die Entwickelung beim Mädchen viel energischer einsetzt und das Gefolge ihrer körperlichen und nervösen Beschwerden ein weit zahlreicheres ist als bei Knaben, so dass für sie die Pubertätsjahre eine schwere Klippe bilden, erwächst für die Schulärztin hier ein Gebiet ganz besonderer Aufmerksamkeit. Es ist bekannt, dass Berufsfrauen, Lehrerinnen, Telephonistinnen, kaufmännische Angestellte, Krankenschwestern u. s. w. viel mehr Urlaubs- und Krankentage benötigen als Männer in entsprechenden Stellungen. Dies wird in vielen Fällen darauf zurückzuführen sein, dass infolge unzweckmässigen Verhaltens in den Entwickelungsjahren physiologische Erscheinungen in pathologische verkehrt sind. Der Schulärztin steht es zu, darüber Erfahrungen zu sammeln, deren Ergebnisse um so wichtiger sind, je mehr das Weib als intellektuelle Arbeiterin einen wichtigen Faktor des Wirtschaftslebens darzustellen genötigt ist. Gelingt es ihr auch zahlenmässig nachzuweisen, dass die den Männern weit voranschreitende Invalidität der intellektuellen Berufsfrau auf unzweckmässiges Verhalten in der Entwicklungsperiode zurückzuführen ist, so wäre der zu beschreitende Weg schon gegeben. Mit dem Einsetzen der physiologischen Reifezeichen lasse man für das betreffende Kind ½–1 Jahr lang weitgehende Schonung in der Schule eintreten, nehme es am besten eine Zeitlang heraus, selbst auf die Gefahr hin, dass es eine Klasse repetieren muss. Es ist immer wieder zu betonen, dass ein Teil der Schülerinnen höherer Lehranstalten intellektuelle Berufe ergreift und dann besonderen Berufsanstrengungen ausgesetzt ist oder gar eine gewinnbringende geistige Tätigkeit mit Gattinnen- und Mutterberuf vereinigt, wozu vor allem eine feste Gesundheit erforderlich ist.

Eine weitere Pflicht der Schulärztin ist es, sich in die Psyche der Einzelnen und der Klasse einzufühlen, den Einfluss ev. nervöser Lehrkräfte zu beobachten. Auch hier ist das Entwicklungsalter mit seiner Suggestibilität, seiner Bereitschaft psychischen und nervösen Reizungen nachzugeben, vielfach bedroht. Ist es in den Knabenschulen besonders die Sorge um das wirtschaftliche Fortkommen, welche Examensfurcht und ehrgeizige Regungen bis zum Selbstmordversuch hinaufsteigern, so finden wir bei den jungen Mädchen häufig eine der Entwicklung des Weibtums conform gehende erotisch getönte Neigung zu Lehrern oder Lehrerinnen, welche bewirkt, dass der ruhebedürftige Organismus zu besonderen Leistungen aufgejagt wird, worauf dieser mit Depressionen, allgemeiner Schlaffheit, Ueberempfindlichkeit, Ungleichmässigkeit in Wesen und Leistungen und anderen neurasthenischen Symptomen antwortet. Die Schulärztin hat dementsprechend auch Aufklärungsarbeit am Lehrkörper beziehentlich der nervösen und psychischen Symptome und Gefahren des Entwicklungsalters zu leisten.

Die hervorragenden Störungen und Erkrankungen der weiblichen Pubertät, die in den Kolonnen I und IV nicht gesondert aufgeführt sind, kommen deutlich bei den Gymnasiastinnen zum Ausdruck. Quantitativ hat die Blutarmut nur in geringem Masse zugenommen, ganz bedeutend aber qualitativ, da wir allein bei reichlich 14 Prozent der für das Gymnasium Untersuchten irreguläre und beschleunigte Herztätigkeit finden. Als beschleunigt wurden Pulse von 100 aufwärts bezeichnet. Die Nervosität, deren eigentümliche Note bei den Lernanfängern geschildert war, findet im Pubertätsalter ihren Ausdruck zunächst auch in der unruhigen Herztätigkeit, dann in besonderer Empfindlichkeit gegen die Schulluft—rasche Ermüdbarkeit, Kopfschmerz, Erbrechen—in hystero- hypochondrischen Vorstellungen, in psychischer Reizbarkeit, neurasthenischer Verträumtheit und Zerstreutheit und einer Reihe von Symptomen psychopatischer Konstitution.

Da die Tabelle mit ihren Zahlen für sich selbst spricht, habe ich nicht die Absicht, die einzelnen Kolonnen näher zu beleuchten. Sie zeigen eines deutlich, dass die schulärztliche Tätigkeit auch an höheren Schulen keine Sinecure ist und dass sie sich in ausreichender Weise mit der Schulhygiene zu befassen, dass sie in hervorragender Weise psychiatrisch und neurologisch zu arbeiten hat.

Bei epidemiologischen Fragen hat der Schularzt dem jeweilig modernen Standpunkt der Hygiene der Infektionskrankheiten Rechnung zu tragen. In Staaten, wo z. B. das Aussondern und der Schule Fernhalten der gesunden Bazillen- und Keimträger und deren Geschwister gesetzlich geregelt ist, liegen die Sachen einfach. Wo das nicht der Fall ist, soll der Schularzt nach eigener Machtvollkommenheit vorgehen und vor allem Beweise sammeln, wie notwendig eine gesetzliche Regelung ist; denn während die ärmere Bevölkerung sich sträubt, gesunde Bazillenträger und deren Geschwister von der Schule fernzuhalten, weil sie die Schule als eine Art Krippe betrachten, widersetzen sich die gebildeten Klassen aus Ehrgeiz solchen Massnahmen, indem sie fürchten, die Kinder verlieren zuviel von dem Wissensstoff. Solange diese Fragen nicht allgemein geregelt sind, ist die Gelegenheit alle Vorsichtsmassregeln zu durchbrechen, leider sehr gross. Als Kuriosum erwähne ich, dass ich gezwungen war, 5 Schwestern, darunter, eine, die Diphtherie überstanden hatte und 3 hartnäckige Bazillenträgerinnen von der Schule im Einverständnis mit der Behörde fernzuhalten. Da verzog die Familie einfach nach einem Vorort, dessen höhere Schulen ärztlich nicht versorgt waren. Die Kinder durften die Schule dort besuchen, und es bot sich damit fünffache Gelegenheit, die Epidemie einzuschleppen. Wenn der Schularzt an den Gemeindeschulen berufen ist, ein breites Material und Unterlagen für sozialhygienisches Vorgehen zu sammeln, so scheint mir die höchste und feinste Aufgabe des schulärztlichen Dienstes an den höheren Schulen im Studium einer vergleichenden Sozialpathologie- oder nosologie zu liegen. Wenn wir zahlenmässig nachweisen können, welche Krankheiten und Schädigungen die Kinder einer bestimmten sozialen und wirtschaftlichen Gruppe betreffen, so ist damit auch schon der Weg zur Sanierung gegeben. Aus einem solchen Studium ergeben sich Vorteile für alle Gruppen. Beweisen wir, dass ein bestimmtes Leiden unter den Verhältnissen, die die höheren Schulen und das wirtschaftliche Niveau der einen Gruppe bieten, nachlässt, so werden wir uns bemühen, die andere Gruppe unter dieselben Lebens- und Studienbedingungen zu bringen, und umgekehrt bei einer Zunahme des Leidens. Den ersten Versuch einer vergleichenden Sozialnosologie auf Grund eines enormen Materiales machte Hermann Kohn mit seinen Forschungen an 50,000 Schulkindern, mit denen er bewies, dass das Schulleben des Gebildeten auf Sehkraft und Sehschärfe ganz besonders verderblich einwirke; 7.5 Prozent der Gymnasiasten waren Brillenträger gegen 0.9 Prozent der Gemeindeschüler, wobei in beiden Fällen eine bedeutende Zunahme der Brillenträger nach den höheren Klassen zu konstatieren war. Ganz einwandsfreie Daten in dieser Richtung an höheren Mädchenschulen zu gewinnen ist ziemlich schwierig, da Eitelkeit der Eltern und der Schülerinnen bei den erwachseneren Kindern häufig das Brillentragen verhindert. So stellt sich die Zahl der Kurzsichtigen faktisch in höheren Klassen noch höher als die Tabelle B angibt, nicht aber die Zahl der Brillenträgerinnen. Ich mache auf den Rückgang vom 12. bis 13. auf das 13. bis 14. Lebensjahr aufmerksam d. i. von 13 Prozent Brillenträgerinnen auf 8 Prozent, ein Befund, der insofern nicht als zufälliger zu deuten war, als er an allen vier Schulen ungefähr gleichmässig beobachtet werden konnte. Hermann Kohn selbst hatte schon erkannt, dass die Zahl der Brillenträger keine absolut sicheren Schlusse ergeben konnte und deswegen später exaktere Untersuchungen angestellt. Als ganz bestimmt muss man annehmen, dass unter seinem Material damals viele Volksschüler brillenbedürftig waren, ohne dass dies erkannt wurde. Wenn sich z. B. in 4 Charlottenburger Gemeindeschulen 4.32 Prozent Brillenträgerinnen finden, d.h. in einwandsfreien, hellen, mit den besten Lehrmitteln ausgestatteten Schulen ca. 5 mal mehr als Kohn mit seinen 0.9 Prozent der Breslauer Gemeindeschüler angibt, so ist dies wohl in erster Linie auf die Tätigkeit der Schulärzte zurückzuführen, welche die Sehinvaliden aussondern, während früher die Kinder der unteren Stände rein zufällig und jedenfalls nur in den schlimmeren Fällen zu einer Brille kamen. Das hier zusammengestellte Material von schulärztlich beobachteten Schulen ergibt immerhin für die höheren Mädchenschulen fast die doppelte Anzahl der Brillenträger gegenüber den Gemeindemädchenschulen, nämlich 7.78 Prozent zu 4.32 Prozent. Jeder Rekord wird allerdings durch die von mir untersuchten Gymnasiastinnen geschlagen. Eine im August 1912 gemachte Aufnahme ergab unter den 168 Schülerinnen des Mädchengymnasiums 42 Brillenträgerinnen, d. i. 25 Prozent. Wenn diese Zahl nun in ihrer exorbitanten Höhe wohl als eine zufällige gedeutet werden muss, so ergab die achtjährige Untersuchung immerhin, dass mehr als 16 Prozent der Mädchen bereits kurzsichtig ins Gymnasium eingetreten waren. Um eine Vergleichszahl zu gewinnen, wandte ich mich an ein nur einige Strassen weiter gelegenes Mädchengymnasium einer der anderen Berliner Vorortstädte und erfuhr, dass dort von 150 Schülerinnen 18 Brillen tragen, d. i. 12 Prozent, immerhin 4 Prozent mehr als der Durchschnitt der höheren Töchterschülerinnen. Man muss nebel den Schulschädigungen unbedingt auch das Moment einer ungünstigen hereditären Auslese ins Auge fassen. Die Mädchen entstammen vielfach schon seit Generationen intellektuell arbeitenden städtischen Familien. Landkinder sind überhaupt kaum darunter. Auffallend ist der quantitativ so grosse Unterschied zwischen der Anzahl der gleichaltrigen Brillenträger der höheren Töchterschule und des Gymnasiums, wie ihn Tabelle B zeigt, der besonders vom 13. bis zum 16. Jahre auffällt, und der wohl darauf zu beziehen ist, dass bei gleichem leichteren Grade von Myopie die Gymnasiastin viel eher zum Tragen einer Brille gezwungen ist. Im letzten Ende heisst das ja nur, dass hier die das Sehorgan schädigenden Momente ganz besonders weitgehende sind, die längere und angestreigtere Haus- und Naharbeit, die Notwendigkeit, Logarithmen zu lesen, geometrische Figuren zu studieren, die Formeln der Atomzahlen zu erkennen, was alles ein scharfes Sehen erfordert, und das alles in der ohnehin zu Schädigungen neigenden Entwickelungszeit. Gerade sie ist vielleicht schuld daran, wenn die weiblichen Gymnasiasten mindestens die fast doppelte Zahl der Brillenträger zeigt als die von Kohn mit 7.5 Prozent bei den männlichen gefundene.

Wenn diese Forschung erwiesen hat, dass die gesteigerten Schulforderungen der höheren Schulen für Mädchen eine ganz aussergewöhnliche Steigerung der Myopie zur Folge hat, so ergab eine andere Untersuchung auf dem kleinen Gebiet, um das es sich hier handelt, Zahlen, die darauf hinweisen, wie spezielle andere Erkrankungen die Mädchen der unteren Stände bevorzugen. Bei einer statistischen Untersuchung des Gesamtmateriales der Nervenpoliklinik der Kgl. Charité, das mir durch die Freundlichkeit des Herrn Geheimrat Bonhöffer zugänglich war, stellte sich heraus, dass unter den in den Jahren 1910 und 1911 zur Behandlung gekommenen 705 reinen Fällen nervöser Erkrankungen, nachdem Schwachsinn und psychopathische Konstitutionen ausschieden, allein 160 Choreafälle waren. Es litten daran von dem Gesamtnervenmaterial unter 368 Knaben 58, d. i. 12.5 Prozent, unter 336 Mädchen 106, d. i. 31.5 Prozent. Diese namentlich in Bezug auf die zu poliklinischer Behandlung kommenden Volksschüerinnen ausserordentlich hohen Zahlen veranlassten mich zu einer vergleichenden Forschung an den 2,620 Schülerinnen der vier hier öfter erwähnten höheren Mädchenschulen und an 3,100 Schülerinnen von vier Charlottenburger Gemeindeschulen, welche ergab, dass von den ersteren im Alter von 6 bis 14 Jahren 13, d. i. 0.49 Prozen, von den letzteren 22, d. i. 0.70 Prozent, Veitstanz überstanden hatten, bezw. noch daran litten. Die Untersuchungen an den Gemeindeschulen hatten in liebenswürdigster Weise die Herren Schulärzte daselbst übernommen. Die Zahlen aus den höheren Schulen dürften ziemlich exakte sein, die der Gemeindeschulen sind eher noch etwas höher zu stellen, da Abortivfälle hier kaum zur Beobachtung kommen. Wenn wir sehen, dass diese hervorragende Erkrankung der weiblichen Kinder sich bei den Gemeindeschülerinnen im Vergleich zu den höheren Töchterschülerinnen im Verhältnis von 3:2 zeigt, so müssen wir doch an besondere Milieuschädigungen denken, welche eventuell bei genauerer Erkennung zu verhüten wären: schlecht abgewartete Erkältungskrankheiten u. a. m.

Myopie und Chorea wurden nur herausgefasst, um einige vergleichende Zahlen zur Sozialpathologie zu liefern, wie sie dem Schularzt in die Hände fallen und natürlich weiter auszugestalten wären.

Um ein gutes Vergleichsmaterial zu gewinnen, würde es sich vielleicht empfehlen, demselben Schularzt höhere und Volksschulen zuzuweisen.

Allgemein dürfen wir für die höheren Schulen folgendes nicht vergessen:

1. Die Schädigungen, welche wirtschaftliche Not den Volksschülern bereitet, werden bei den höheren Schülern aufgewogen durch die Ueberbürdung, Mehrforderung an die Intelligenz, eine höhere Stundenzahl.

2. Das Schülermaterial der höheren Schulen rekrutiert sich nur zum Teil aus wirtschalftlich gut gestellten Kreisen, zum andern Teil aus unter anderen Lebensformen in gewissem Sinne Notleidenden, zu denen, was die Mädchenschulen betrifft, beconders diejenigen gehören, an welche durch die Notwendigkeit einer Berufswahl höhere Anforderungen gestellt werden.

3. Allgemeinuntersuchung aller für Gymnasien bezw. das Studium vorgemerkten Mädchen ist in Anbetracht der höheren Anforderungen an Körper und Centralnervensystem im akademischen Frauenberuf eine dringende Forderung, um schwächliche Elemente auszusondern, um insonderheit zu verhüten, dass der weibliche Gesamtorganismus unter Ueberanstrengung leide und die intellektuellen Fähigkeiten auf Kosten der mütterlichen Anlagen ausgebildet wurden. Hier ist wie überhaupt für das puberale Alter der weibliche Arzt zu wünschen.

4. Eine Reihe von Leiden und Schädigungen der Schüler können weder von den Eltern noch vom Hausarzt erkannt und bekämpft werden, da sie einmal hauptsächlich in der Schule zum Ausdruck kommen, aus Schulschädigungen hervorgehen oder durch solche vertieft werden. Sache des Schularztes ist es, solche Leiden zu erkennen und für Abschaffung der schädigenden Momente Sorge zu tragen.

5. Allgemeine Untersuchung der Lernanfänger in Hinsicht auf ihren körperlichen, nervösen und Intelligenzzustand ist für höhere Schulen eine dringende Forderung, damit körperlich und geistig schulunreife und schwachsinnige Kinder im eigenen Interesse und in dem der Schule ausgesondert und zwecks weiterer Reifung zurückgestellt werden können.

6. Dem weiblichen Schularzt fallen ganz besondere Untersuchungen über Schulschädigungen des Entwickelungsalters und hygienische Belehrung der jungen Mädchen zu.

7. Der Hauptwert der schulärztlichen Forschungen an höheren Schulen liegt auf dem Gebiet der vergleichenden Sozialnosologie. Je mehr wir die Verteilung der Jugendkrankheiten und -leiden nach den verschiedenen sozialen und damit einhergehenden Schulmilieus

kennen lernen, um so besser werden wir imstande sein, sie zu bekämpfen.

Der schulärztlichen Beobachtung unterstanden in den Jahren 1904–1912 insgesamt 4,120 Schülerinnen, darunter 327 Gymnasialaspirantinnen. Zur Untersuchung kamen 2,295 Töchterschülerinnen und sämtliche 327 Gymnasialaspirantinnen. Nach Prozenten berechnet vertritten sich die Erkrankungen folgendermassen.

Tabelle A.

Es litten an:	I. Sämtlicher 4,120 Schülerinnen.	II. Aller zur Untersuchung gekommener 2,295 Töchterschülerinnen ohne die Gymnasialaspirantinnen.	III. Der 327 Gymnasialaspirantinnen.	Ueberwachungsschülerinnen des Jahrganges 1911–12.	
				IV. Der 295 Lernanfänger von 1911–12.	V. Der 416 im Jahre 1911–12 untersuchten älteren Töchterschülerinnen.
	Prozent.	*Prozent.*	*Prozent.*	*Prozent.*	*Prozent.*
Blutarmut	15.77	25.00	25.07	24.50	25.00
Irregulären und beschleunigte Herzthätigkeit	3.03	5.00	14.37	2.71	5.00
Herzfehler	.06	.95	1.52	....	....
Nervösen Erscheinungen	7.88	12.50	7.03	16.70	14.42
Skrofulose aller Grade	13.35	20.00	15.95	35.00	16.58
Wucherungen im Nasenrachenraum	5.53	8.50	1.52	9.15	6.00
Kurzsichtigkeit	8.73	14.00	16.20	....	15.86
Sehschwäche	.36	.57	3.00	.33	2.40
Schielen	2.04	3.20	.61	3.39	2.16
Bindehautkatarrh	.97	1.78	....	....	....
Hörschwäche höheren Grades und beider Ohren	1.94	3.40	2.75	2.03	5.25
Stottern	.80	1.25	....	.33	1.68
Schlechtem Ernährungszustand	.92	1.44	2.44	2.03	1.92
Chronischen Erkrankungen der Luftwege	2.01	3.15	3.02	3.72	2.88
Wirbelsaülen-Verkrümmung	4.83	7.00	3.42	3.39	15.38
Schwachsinn bezw. Schulunreife	1.70	2.66	....	6.75	....

Tabelle B.—*Brillenträger.—Anzahl der in Schuljahr 1912 ermittelten Brillenträger unter den Schülerinnen.*

	Vier von Gemeinde (Volks) Schulen.			Vier höherer Mädchenschulen.			Eines Mädchengymnasiums der Stadt Charlottenburg.		
	Anzahl der Schülerinnen.	Anzahl der Brillenträgerinnen.	Prozentzahl der Brillenträgerinnen.	Anzahl der Schülerinnen.	Anzahl der Brillenträgerinnen.	Prozentzahl der Brillenträgerinnen.	Anzahl der Schülerinnen.	Anzahl der Brillenträgerinnen.	Prozentzahl der Brillenträgerinnen.
Im Alter von Jahren:									
6–7	380	2	0.52	296	7	2.39	....	....	....
7–8	398	12	3.01	304	15	4.93	....	....	....
8–9	464	9	1.94	321	16	4.98	....	....	....
9–10	480	22	4.58	328	24	7.31	....	....	....
10–11	531	39	7.34	306	26	8.49	....	....	....
11–12	392	24	6.12	324	32	9.87	....	....	....
12–13	455	26	5.71	279	38	13.62	33	3	9.0
13–14				203	17	8.37	29	8	27.6
14–15	....	....	....	151	15	9.93	26	4	15.3
15–16	....	....	....	108	14	12.96	23	8	34.7
16–17	....	....	....	....	....	....	31	10	32.2
17–18	....	....	....	....	....	....	26	9	34.6
Gesamtzahl	3,100	134	4.32	2,620	204	7.78	168	42	25.0

Tabelle C.—*Chorea minor.*

	Gemeindeschülerinnen.			Höhere Mädchenschülerinnen.		
	Anzahl der Schülerinnen.	Anzahl der Chareatischen.	Prozentzahl der Chareatischen.	Anzahl der Schülerinnen.	Anzahl der Chareatischen.	Prozentzahl der Choreatischen.
In Alter von 6–14 Jahren......	3,100	22	0.70	2,620	13	0.49

Anstatt Brillenträgerinnen in Toib. D. jesmot Chareatischen.

[1] Der in No. 5, 1912, des "Schularzt" erschienene schulärztliche Gesamtbericht für Leipzig 1910–11 gibt eine Uebersicht über 48 Schulen, darunter 5 höhere Bürgerschulen.

[2] Dr. Therese Oppler und Dr. Clara Bender haben ihre Erfahrungen über je ein Sondergebiet publiziert. Die Erstgenannte hatte unter 783 höheren Töchterschülerinnen 252, also beinahe ein Drittel Ueberwachungsschülerinnen.

THE PUBLIC SCHOOL AS A POSSIBLE FACTOR IN PREVENTING INFANT AND CHILD MORTALITY.

Henry L. Coit, M. D., Newark, N. J.

There are a great many causes of infant mortality, many more than in any later period of life, more than in all other periods after infancy combined.

Some of these are contributing causes; they are obscure and indirect, like parental indifference, which is conducive to neglect; like adverse social and industrial influences upon the prenatal and nursing periods, and like ignorance, which surrounds not only the newly born but the older infant with many conditions inimical to its life.

Some of these are immediate causes; they are obvious and direct, like milk which often conveys infectious disease; like malnutrition from irrational feeding, which is none the less direct, though more insidious, and like congenital physical defects, which are such potent factors in the mortality of infants in the first few weeks of life.

There are many who would claim that human mortality in infancy is not an evil, yet those who have experienced or witnessed a mother's grief when contemplating a vacant crib will not agree. We believe that it is an economic misfortune for any nation to lose its children, and that no nation can rest on a firmer foundation than the vitality and viability of its offspring.

While the mortality phase of the question can not be magnified in importance, yet there is another aspect of the question which concerns us far more, namely, the physical condition of those, who, while handicapped in infant life, still remain to struggle on up through childhood to feeble, ineffective, and dependent adult life.

While millions of infants suffer during a short and terrible life, and die before they realize what life means, many more millions are so unfortunate as to live on with a physical handicap which makes life a torture, the home a pandemonium, and family life anything but desirable.

This is not an unmixed evil, however, as the following quotation from Nevin, of Manchester, will show:

> It is not merely, then, our desire to reduce infant mortality, which causes us to study this problem, but we are moved even more by the consideration that, for every infant we can save, we shall raise the level of many others who might have pulled through, but not so successfully.

The best means of preventing sickness and death would be to raise the living power of the individual to what is called immunity. If we could apply this principle to infancy and childhood, through educational and prophylactic measures, we would bring about the greatest possible physical efficiency in manhood and womanhood.

While physicians have led in this crusade against infant mortality, it is strictly a problem in preventive medicine, and therefore clearly to be solved by educational methods, which should be applied by the people (the State), at the expense of the people, and for the people.

Beyond this, when we forecast the future of our children and regard them as prospective parents and citizens, to whom we must leave the responsibility of parenthood and citizenship, and who must take, maintain, and develop the institutions which our fathers established and which we transmit, the question assumes an important relation to the stability of the nation.

The educational board of Manchester, England, in 1902 instituted the instruction of seventh-grade schoolgirls in infant hygiene so that they could be useful as the mother's helper. They were called "little mothers." The plan has been successfully introduced in several of our own cities, with excellent results and lasting benefits to the infants at home.

Another and a more widspread movement antedated the foregoing plan by 10 years. The Consultation for Nursing Mothers (Consultation de Nourisson) is a center for the education of the mothers. It was also of European origin, in 1892. For this institution we are indebted to Budin, De Four, and Variot, in France. When properly organized it is always under medical control and direction, and its station work is followed by a visiting nurse who supplements the medical work by teaching the mother in her home.

We propose, as a comprehensive plan to check sickness and death among infants and young children, that to the Manchester plan for "little mothers" shall be added the French plan, and that the "consultation for mothers" shall be conducted within the public school and finally become part of its system.

It can not be repeated too often that the most fundamental cause of infant and child mortality, expressed through many channels, is ignorance, and the most potent influence which will destroy and remove it, is imparted and applied knowledge.

Infant and child hygiene and the care and management of children should be taught in women's colleges, in finishing schools for girls, and to pupils of the eighth grade, the "little mothers," but a much wider field for this instruction would be the mothers of the industrial class in the congested school districts, many of whom did not, and most of whom could not, complete the curriculum of the school.

This instruction has, heretofore, been given by private philanthropy in hospitals and infant-welfare stations at a few isolated points, and has been made available for comparatively few of the great mass of mothers who need it most.

Since the great majority of these women do not realize their ignorance until they have children to care for, and since the mother has the custody of the child before and after the school period, and since she was not taught infant welfare in the school, she ought to receive a post-graduate course from the school, with her own baby as an object lesson.

This kind of instruction applied to the indigent mothers in a school district would be justified, for the safety of the school itself, since, from these homes, where parental ignorance prevails, there is a daily migration of older children to the school, who often become the carriers of disease.

The home and its hygiene, the mother and her maternal fitness, the children and their health, are all intimately linked with the school, and anything affecting the integrity of any of these, is a menace to the school.

Hospitals and infants' welfare stations are too few and too scattered; public schools are found in every district, are easy of access; and, aside from the importance of having the mother's interest early linked with the school where her child will later spend much of its time, the logical rallying point for imparting and receiving public instruction is the public school.

Teaching the mother or caretaker to lay firmly the physical foundation of the child, as a preparation for efficient intellectual work during school life, which continues through so long a period of childhood, is, we believe, a legitimate function of the public school.

Such knowledge, properly imparted through this channel, would become a most effective factor in the prevention of infant and child mortality, because it would be bestowed upon a far greater number than, as now, through isolated medical charities.

The knowledge necessary to the attainment of these great objects is now within our grasp, is systematized, and needs only the active agency of the public school, with the cooperation of trained physicians and nurses, to make it effective.

The plan of placing "the mothers' consultation" in the school grew out of necessity. In the summer of 1911 one of the stations of the Babies' Hospital, in Newark, N. J., located in a congested district, was no longer available, and was temporarily transferred to a vacant schoolroom nearby. The writer then saw an opportunity to illustrate a plan for putting such consultations in all the elementary schools. Application was made to the board of education for the use of the Eighteenth Avenue School, which was granted for the purpose of working out the details of the plan under the direction of the Babies' Hospital staff.

There is no work of a strictly medical character performed at these consultations or in the homes; only the instruction of the mother and the gathering of data to determine the influence of instruction upon the viability of the child. This includes records of the vital phenomena and social statistics. Instruction is given to the mother in the following: Hygiene, reasons for cleanliness, dangers of dirt, care of the new born, importance of breast feeding, the care of milk, artificial feeding, weaning, children's diet, management, advantage of system, the bath, the clothing, the rooms, the air, ventilation and sunshine, the baby's bed, its sleep, danger of anodynes, exercise, and the care of the sick child. If a child is found ill it is referred to the family physician, or, if too poor, to a medical clinic or hospital.

The link which will fix the mother's interest is the periodical weighing of the baby, which is the best index of its progress. The interest of the visiting nurse in the infant's welfare, and her attempt to help the mother apply the instructions given by the physician will engage the mother's best efforts to apply them, and one year's teaching of this character becomes a liberal education in the hygiene of the home.

The consultations, one for foreign-speaking mothers and one for English-speaking mothers, are in charge of the medical staff of the Babies' Hospital, with the active cooperation of the principal and his teachers, upon which depends largely the success of the experiment.

A detailed report of this work and its results for the first year will shortly be made to the Board of Education of the City of Newark, with the hope that it may be found valuable enough to be established elsewhere.

THE NEED OF COMMUNITY PLANNING IN CHILD-WELFARE WORK.

Mr. Wilbur C. Phillips, Milwaukee, Wis.

I must ask the forbearance of my hearers if I repeat in this paper what I may already have said before; but the need which I present seems to me to be so great, and its full appreciation so rare, that reiteration of some of the fundamental principles which underlie it may perhaps be justified.

I have purposely reduced my paper to its briefest and most concise form, and shall be thankful if it makes one point and drives it home.

Child welfare, in its narrowest sense, is work (*a*) to reduce infant mortality, and (*b*) to protect the health of the babies who have been saved.

In a broader sense, it is work to lay the foundation of health among children up to school age.

In its broadest sense, it is work for the physical, intellectual, and spiritual development of all children—those who are living as well as those who are to be—in other words, of the race.

Child welfare is the most important branch of health work.

First. Because deaths under 1 year of age exceed in number deaths among all ages from any single cause, the general death rate of any city being practically determined by the number of its infant deaths, which usually constitute from 20 to 30 per cent of its total deaths.

Second. Because a great proportion of infant deaths are almost immediately preventable.

Third. Because the child of to-day is the adult of to-morow, making child-welfare work the cheapest and most effective kind of preventive health work.

Fourth. Because child-welfare work appeals to the sympathy and understanding of the laity, winning cooperation and support where other forms of preventive work fail.

Fifth. Because, in order to preserve child life, it is necessary to deal with every condition which affects the health of the family, work for child welfare thereby constitutes the best opening wedge in laying the foundation of general preventive health work.

Child welfare is not to be solved through the application of any single remedy. The pasteurization of milk, the instruction of mothers, the boarding out of babies—valuable as they are—will not in themselves avail.

All factors must be taken into consideration.

Mothers who overwork during pregnancy are incapable of bearing strong children.

Mothers who are sick or diseased, underfed, or malnourished, are hindered from giving suckle.

Mothers who scrub floors and take in washings in order to supplement the family income can not care for their children properly.

Every case of tuberculosis which throws a wage earner out of employment and places additional responsibility upon an already tired mother contributes to infant mortality. Every boy or girl who, through lack of parental guidance or sympathetic instruction in our public schools, grows up impure in thought and action, endangers the health and life of some baby in the future.

Infant mortality is a social problem, depending for its solution upon the correction of every specific evil which to-day engages the attention of philanthropic societies and civic authorities.

The business of life—the excuse for industry and government, laws, and institutions—is the rearing of children.

It is important therefore that we should plan wisely for the child.

A community child-welfare plan is synonomous with a social program. Its chief distinction lies in its point of approach—the child, as I have said, furnishing the best and most easily understood argument for social effort.

A complete social plan should, of course, embrace the improvement of those conditions of industry, employment, sanitation, wages, housing, and so forth, which deleteriously affect the health of families and, through them, of the child. This is a matter for public control and responsibility, to be brought about by collective action on the part of people in the aggregate, and it must be achieved before the welfare of the child can be completely attained.

Of equal importance, however, is the immediate necessity of supplying to every family the knowledge, medical and nursing supervision, and material things needed to prevent ill health and conditions deleterious to home life over which the members of those families largely have control. This is a matter of organized preventive health education and relief.

No city can plan intelligently for its children unless it has the two programs just described—a broad social or ultimate program and an immediate program.

Neither of these programs can be formulated without definite knowledge of community conditions. Such knowledge can not be obtained without a comprehensive thorough-going community survey, such a survey as the one in Pittsburgh being none to good for the purpose.

Once the survey is complete, every problem capable of present attack should have a definite program outlined, and each of these programs should again present a goal at which to aim and should offer suggestions for immediate work.

Without an ultimate program, immediate efforts are too often of little permanent value.

Without an immediate program, it is idle to discuss future plans.

The two are absolutely essential.

We can work wisely now only in so far as we see clearly where we are headed. On the other hand, we can never arrive at the point we wish to reach unless we work wisely now.

The criticism I would make of the average survey is its failure to provide these two programs.

Most surveys are merely records of investigations made, and fail either to provide a constructive plan or methods of organization.

This is due, first, to the lack of individuals experienced in community social problems who, by virtue of their experience and training, are able to take the data and information gained through research and investigation, and construct therefrom a social program fitted to the special needs of a given community; second, to the vastness and complexity of our social problems, which have baffled and discouraged those who have approached them constructively from the community standpoint.

If we are to solve the problem of child welfare we must first of all engage social organizers who will take up the work where the surveyor leaves off. If the surveyor and organizer can be identical, so much the better. Too often those who make our surveys and investigations leave the community just when their experience and knowledge begin to make them valuable.

Secondly, we must see and understand that the problem of supplying the knowledge, medical and nursing supervision, and material things necessary to the immediate program of child welfare at least, complex and difficult as it is, is no more complex or difficult than many of the problems of ordinary business, and like them can be overcome by the application of business principles.

Consider for a moment the various forms of social work, private and public, whose aim it is to supply one or another of these social needs.

From the standpoint of concentration toward a single result, could there be a worse example of loose, haphazard, unbusinesslike effort?

These organizations may be likened to the small business concerns which existed before our large amalgamated forms of industry sprang into being. With each of them the overhead charges are out of proportion to the amount of goods handled. As a result, the cost of the social commodity which they supply is so great that only a small part of the need can be filled.

Absolutely no need exists for separate organizations to supply, not only those special commodities which suggest themselves at first thought in connection with child welfare, namely, prenatal instruction to mothers, care and attention to prevent blindness, work to improve the standards and practices of midwives; maternity work, postnatal instruction to mothers, material relief, etc., but also those other more general commodities supplied by organized philanthropy and by the community itself.

This is not theory.

The work of the child-welfare commission in Milwaukee, one phase of which was the maintenance of practically such a district health station, proved it beyond a doubt.

Efficiency and economy demand that our social agencies, public and private, each handling its own special social commodity, shall merge under community leadership.

This merging may not take place to-day or to-morrow, but it must and will inevitably take place.

The rapidity with which it takes place will measure the rapidity with which we achieve social progress, and thereby solve the problem of child welfare.

Only by community planning can this result be obtained. The task is too big for single agencies. The direct leadership, power, and authority of the municipality is essential where so many and complex forces are to be harmonized and brought together.

It seems like a tremendous task—this concentration of social forces toward an immediate child-welfare program. So far there can be no doubt but that it has baffled the workers.

But is it after all so difficult?

Look at our largest cities, for example, and try to imagine them, not as a hodgepodge of conflicting forces, but as a collection of small areas. Try to imagine in each of these small areas a social bureau whose aim it is to distribute to every family therein knowledge, medical and nursing supervision, and the material things necessary to the conservation of the home and the proper development of children.

Is it hard for you to imagine that such a bureau, with the authority of the municipality behind it, could do for 100 per cent of the families in its district the work just indicated?

It is not hard for me, because in our work in Milwaukee the child-welfare station either actually did all of these things or proved very clearly the possibility of doing them.

Wise community planning, based on a comprehensive survey under expert leadership and participated in by all individuals and agencies interested in public health, will overcome many difficulties which seem insurmountable to-day.

The ultimate goal is a social program.

The immediate aim should be the organization of all the present social agencies for a cooperative, and as soon as possible an amalgamated, use of the same mechanism of distribution.

Without the latter the former will never be achieved. Industry, employment, and wages can not be considered apart from the home. Economic conditions can not be changed merely by effort from above. The individuals whom it is desired to help must be taught higher standards of living, so that they will demand these improved conditions for themselves and their little ones. Community planning, in order to correct these basic social conditions, demands community education in all things which affect the health of the family and of the home, and this, as I have endeavored to show, can only be possible by concentrated effort under community leadership.

PARENTS' COOPERATION IN PROMOTION OF CHILD HYGIENE.

Mrs. Frederic Schoff, President National Congress of Mothers. Philadelphia, Pa.

Without the cooperation of parents little can be accomplished in promotion of child welfare.

Yet to-day parents are indifferent and unconscious of their great responsibility and of their own ignorance, with its fatal consequences.

There can be no real progress in promoting child hygiene until definite, successful, and comprehensive measures are set in motion to enlist those who are the actual caretakers of the children.

There are several groups of people whose support must be enlisted before real progress can be made. Physicians are already interested. Parents, boards of health, educators, and city councils still need to be aroused and stirred to a realization that infant mortality is preventable, and, that being a fact, it is criminal not to prevent it.

Those who are considering child hygiene in its broad aspects have two things to do: First, to meet as well as may be done the present conditions of ignorance and indifference prevalent in all walks of life. Second, to take measures to prevent the continuance of such conditions in the next generation.

The National Congress of Mothers, which has for its sole work the provision of conditions for the best development of every child in body, mind, and spirit, has the advantage of a constituency thoroughly alive to the need of education for parenthood. For 16 years it has striven to show the limitless possibilities of childhood when properly understood and developed.

It takes time to battle down the old wall of belief that mother instinct teaches a woman all she needs to know about child nurture. So strongly has this become an accepted part of our life that no recognition of woman's life as home maker, wife, and mother is given in her education. To help her in her great mother work the Mothers' Congress has had to devise temporary means to reach her where she is, to awaken her responsibility to the welfare of her children, and to guide her in the study of child nurture.

There are certain principles that, from experience, have been proved necessary to success in enlisting parents in the great movement for child hygiene.

The child hygiene movement must be placed clearly on an educational basis, differentiated from charity, if it is to succeed. It must not be emphasized as for poor mothers, for that makes it difficult to reach thousands of homes which need enlightenment. The movement should be, in the beginning, a campaign of education as to the difference in death rate in districts where parents have been educated in child hygiene and in the same or similar districts before education.

Consciousness of the need must be created before instruction can be given.

Boards of health can do much to promote interest and place the movement on an educational basis. A department especially devoted to child hygiene should be created and given to a specialist in the subject. A room should be fitted up with a permanent educational exhibit, showing the proper development of children and results of improper care. Birth registration, when rigidly enforced, makes it easy to know of every new mother. A pamphlet expressing the interest of the board in the future welfare of the baby, giving some rules as to its care, inviting the mother to visit the mothers' room in board of health, and asking her cooperation in the health work for the babies of the city, if sent to every new mother, would bring home the fact that the baby's health is a matter of interest to the city, and it would give emphasis to the need of special study to keep it.

The service of a nurse specially trained in baby hygiene, who can visit and organize district groups of new mothers for child study, gives a more permanent value to the movement for child hygiene.

When a circle of mothers once realizes that child hygiene is a science, not a fad, they become ardent promoters and win other mothers.

They begin to see that child nurture in its every phase is no less a science, and so the uplift of the race will begin.

Parents and boards of health will need the support of councils to give the funds necessary to conduct child hygiene departments and make them a real educational center for every mother.

At the present time a campaign of education is needed among men to show that the support of measures to save life can not properly be ignored, and among women to prove that mother instinct is not sufficient to prevent infant mortality. Baby-saving shows, health contests, or any movement that educates public opinion as to the need for ample support for life saving are valuable and necessary. The National Congress of Mothers, with its organization for parental education, has been and will be a vital factor in winning cooperation of mothers in the promotion of child hygiene. The thorough organization of parents is a necessary preliminary.

There can be no doubt that knowledge on this subject should be possessed in a large degree before the time comes for its use and that the need for it is universal. The schools must recognize this. Education of every child should include thorough teaching in the laws of hygiene. The great functions of fatherhood and motherhood should not be ignored in the training of children for life. They should be held up as the highest and most far-reaching functions of human life.

Children love to play with babies, and the protection of baby life would not be an abstract subject if real babies were a part of it. This knowledge is of such vital moment to everyone that no child should leave school without receiving practical instruction in infant hygiene. Grammar schools would have to include it to make it available for the masses who never go further in school life.

Child hygiene not only includes the care of the baby, the foods that nourish and build up bone and muscle, but the use and care of every function of the body.

To exclude instruction on the procreative organs is as injurious in its consequences as the ignorance of infant hygiene.

Parental ignorance must be replaced by a thorough knowledge on the part of parents as to these important functions and the necessity for teaching children to look at them from the highest point of view. Parents do not realize that they themselves are largely at fault for the low moral tone that causes the social evil. They have never been taught concerning this phase of hygiene. They can not give their children what they do not themselves realize or know, yet until parents are thoroughly aroused to their duty in this regard, little progress can be made.

The National Congress of Mothers believes that there should be no undue emphasis on this, but that the first step necessary to enlist parents in this phase of child nurture is to show them clearly the terrible results of failure to protect innocent boys and girls by clear teaching as to the sacredness of the generative functions and the consequences of their violation.

Without question this teaching is the duty of every parent, but at the present time parents are not prepared to give it, and there are few who approach it from the right attitude, which is as important as a knowledge of the facts.

To secure the cooperation of parents, to enable them to fulfill their duty in this vital matter, is the first step toward its solution. It is the opportunity of the parent teacher associations.

The Congress of Mothers, in its organization of parent teacher associations in connection with every school, supplies in its recommended courses of child study the parents' duty in this important particular.

Every parents' association is urged to study every phase of child hygiene as fundamental. The study of the mental and spiritual growth is advised and fostered by suggestions as to where and how the latest and best thought on these subjects is available.

The National Congress of Mothers is in reality an educational school for parents and others who have the training and care of children.

It plans its work to reach parents wherever they may be, and adapts its educational work to meet present needs, while, at the same time, it strives to promote opportunities for more intelligent parenthood for the coming generation.

Being international in its scope, having cooperation with Government departments and boards of health, it seems the necessary medium for the use of physicians and scientists in reaching the homes where the laws of hygiene must be so simply and clearly stated that the simplest mind may understand them.

There must be organization and machinery for promotion of any propaganda.

The National Congress of Mothers and parent teacher associations have made great strides in the organization of the parenthood of the world, that through definite channels of communication every home may be reached.

It joins the hands of parents with educators. It doubles the educational opportunity of the school system without increasing the expense. It stands as the center of education in child nurture for parents, and counts no parents' association of real value unless it gives precedence to the study of the child.

To reach the mothers in the years before school claims the children, it has devised cooperation by organizing parents in the churches for study of child nurture. To apply the knowledge of the greatest leaders in child hygiene to actual life one must reach the homes of the world. The National Congress of Mothers invites your serious investigation as to its methods, and your earnest cooperation in the extension of the cooperation it is already giving to this important cause. "One generation, one entire generation of all the world of children, understood as they should be, loved as they ask to be, and so developed as they might be, would more than begin the millennium," has been truly said by that lover of childhood, Frances Hodgson Burnett.

Child welfare is at the foundation of world welfare. Child nurture is the greatest science of the age. To arouse the whole world to a realization of its duty to the children, to show that time and money spent on reform could be saved provided every child had the proper treatment in home, school, church, and State, is the propaganda in which all who see the infinite possibilities of the child should unite.

THE CONSERVATION OF THE CHILD.

Dr. Charles Gilmore Kerley, New York City.

One who has followed a great many children in various walks of life from infancy to adolescence has necessarily had definite impressions made upon him in relation to the development of children. My subject, "The conservation of the child," allows me a latitude extending from prenatal life to adolescence. Obviously, in a 20-minute paper, but a few essential principles of so broad a subject may be considered. I will take up those features of a child's management which appeal to me as those most neglected at the present time.

All children, regardless of their social status, are very much alike at birth. All children are born dependent—immature. They do not actually become adults before the seventeenth or eighteenth year of life. There is thus at least 16 years of growth and development, with all that development entails. In the lower animals the reverse is the case. Adolescence is reached much earlier, and the period of dependency of the young upon the parent lasts but a very short time, a few months in some instances and a year or a little longer in others. As a consequence of this order of things, the matter of heredity in the lower animal is a much greater factor than in man. In the human, because of immaturity, dependency, and prolonged development, environment is of much greater import than heredity. Because of the immaturity and the long plastic impressionable period of 16 years, we may mold a child largely as we will, and the fashioning and the molding, whether it be done well, indifferently, or badly, depends more upon the molder and the child's associations than upon the material worked upon.

I have, during my entire professional life of 25 years, been resident or attending physician at children's institutions, from which many hundreds of children have been adopted or otherwise sent out into the world. I have cared for these children from the lower walks of life, the illegitimate, the offspring of crime, depravity, and poverty in large numbers. I have seen children from such origin well cared for in institutional life, kindly treated, and well started physically, and when adopted or otherwise placed in good homes they have in every way taken and maintained their place with those who had the advantage of everything that is desirable, both as regards birth and environment. Had these children grown up in the more or less careless, if not vicious, environment of their birth, a certain number of the boys would have been members of the various predatory gangs, of which there are many in all large cities and which are schools of crime and preparatory schools for reformatories and prisons. A certain proportion of the girls would have been numbered among the criminal and the depraved. In the school, in college, and in the world, the unfortunate born, if given a fair opportunity, may take as high a position as the better born citizen.

If we reflect a moment, observations such as these tell us that we make in large degree our criminals and the otherwise undesirable of both sexes. And I repeat that, by association, children are fashioned well, indifferently, and badly. If two infants of equal vitality, one born in the palace and one in the poorest tenement, were exchanged on the day of birth, each would work out his destiny along the lines of his environment. The child of the tenement would grow up to the palace and the offspring of the palace would remain on the level of the tenement environment. I refer now to the great majority of humanity. I realize that there are brilliant exceptions to my theory, but they are so exceptional that they stand out the more prominently. Other States, and lately New York State, have passed laws authorizing the sterilization of criminals and degenerates, with the hope of lessening the progeny of the undesirable. I agree that the purpose of the law, with its attendant good effect, should be carried out, not only because of inheritance, which plays but a small part, but because fewer helpless mites of humanity will be thrown in the environment of their progenitors and grow like them. We forget, in blaming crime, degeneracy, and alcoholism to heredity, that the child lived and grew and got his impressions from that vicious association. The sterilization of criminals and degenerates will not appreciably lessen crime, except in the sense that very few less children will be born. We make no bid for a large birth rate. When children are all properly cared for, then, and then only, can the State ask for an increase in the birth rate. In the human not only do physical qualities in a limited sense admit of inheritance, but also the mentality, as relates to brain capacity, provided the environment is such as to bring out what is best in the individual. Undesirable environment in the clever subject makes our most dangerous criminals.

Character indicates the individual. Heredity has but little influence in determining character. Character, above all things else, is the product of environment.

Degeneracy, crime, and prostitution among the people are, in a large degree, the fault of the State, because those responsible neglect the young, and the State and its representatives attribute crime to inheritance of this oppressed foreign-born individual, and thus shirk the responsibility.

A man was recently murdered in the most prominent part of our principal street of a great city. The perpetrators, the framers of the crime, were not the offspring of criminals. They are the logical product of our handicraft in the management of the young.

No less an authority than Wm. Allen Pinkerton, in the May number of Hampton's Magazine, in the article entitled "Is there a criminal class?" states that there is no criminal class, and that society has begun to learn that one way of preventing boys and girls from becoming criminals is to give them proper care and attention when young. The children's courts that have been established in several cities he believes to be in the experimental stage, but thinks they have already demonstrated their usefulness as a means of diverting youthful offenders from the downward path.

Children's courts are necessary, and it is sad that this is true. When the child is brought to the court for the perpetration of a real crime much damage has already been done. Many of the arrests of children, however, are for trivial offenses, the evidence of superfluous energy, and are of no great significance in criminology.

The remedy for our complaint sounds simple, and yet it is so hard to fulfill. All that any fairly healthy born infant requires, in order to be developed into a responsible citizen, is that he receive, during his plastic period—the period of receptivity—suitable food, clothing, fresh air, adequate rest, right association, right teaching, and kindness. It would seem that every child had a right to demand such simple benefits.

I further learned, in my association with children, that all prefer to be good. The child is by nature happy, impressionable, and irresponsible. Naturally vicious children are degenerates, and defective, vicious degenerates are very few and should be placed by themselves and supplied institutional care and supervision by those skilled in the work. They are in another class from our normal-born child and require no further consideration at this time. In all my entire experience with children I have known just one hopelessly bad boy.

The children of to-day will be the Nation's support and defense a few years later, and when children are not properly cared for and reared it is the duty of the State to adjust the situation to the child's advantage and to its own, a difficult task, but not unsurmountable.

We spend millions of dollars for the maintenance of the abnormal, for the care of drunkards, criminals, imbeciles, insane, and for politicians. Why not expend a little more on the normal child who is not having the possibilities for proper development, namely, right food, clothing, fresh air, and decent association? Our present policy is to let him drift until he becomes a nuisance or a menace and then, having lost a good citizen, we incarcerate and support him for our protection.

Of charitable bodies and associations of different kinds, there are many, and they do good work in spots and bad work in spots, and they are very expensive. In large cities, due to defective general organization, the effort of one association overlaps that of the other. A mother told me last summer that she had three sets of people coming to her house advising her how to bring up her children. Charitable bodies and private societies of different types do estimable work, but they do not even scratch the surface of necessity. These efforts are usually directed in the larger cities, and, while much is accomplished, a great deal more remains undone; and, furthermore, the few large cities are but a small part of the country. This we often lose sight of. In every State there are hundreds of villages of five hundred, one thousand, two or three or ten thousand inhabitants, and smaller cities of a greater number of inhabitants, and millions of square miles of populated open country. These villages, cities, and country districts have growing boys and girls in them, boys and girls who must be amused, entertained, and have a social life which is an absolute necessity of the young. In the absence of something definite to do they amuse themselves. The boys "hang around" the street corners and gradually gravitate to the saloons as they grow older. They have vicious association with those older than themselves, and this forms a large part of the association of many thousands of boys throughout the United States. In the evening the boys and girls congregate on street corners or elsewhere, and this is the first act in the drama.

It has been stated that idleness is the mother of mischief. It may be added that the absence of right amusement is the mother of crime. Do not imagine for one moment that the thousands of women who practice open prostitution in all large cities are bred in the large cities, or that those of either sex who fill our prisons, asylums, and reformatories are all city bred.

If I were given an exceedingly large sum of money and told to spend it to the best of my judgment for the uplift of mankind, I would spend every cent of it, in the cause of humanity and its eternal salvation, through providing entertainment and amusement, and by these means make vigorous bodies and healthy minds. You have got to accept certain features of the child's equipment as it is. Force, pressure, punishment, and pleading, all useful measures when rightly applied, have proved failures. They do not cover the field. The church and the school, each doing most admirable work in its own way, are not sufficient, and in saying this we judge simply by the results. If, in all the years these measures for the benefit of humanity have been in operation, they had been successful, this paper and many others on similar topics would not be necessary. The best means of approaching the child is through his demand for amusement, which is inherent in him, and through a further trait, the demand for almost incessant occupation when awake. Amusement and entertainment may be made just as educational as we like; in fact, play of the right kind is always educational. Children must be busy, and what is there to do in a city street or in a country village that will make a boy or girl think and best bring out that which is in him?

I was born and reared in the country, but have spent one-half of my life in a large city. Actual amusements arranged for me in my early experience were few, and stand out prominently in my recollection as great events. There was the Sunday-school picnic, if it did not rain on the day appointed; there was the church fair; a circus every two or three years; a county fair held in a neighboring village. These comprise the sum total of the country boy's amusements, excepting those that he makes himself, and my lot was not better or worse than every boy I knew. In the city there are the streets, dangerous and dirty, back yards; and parks, overcrowded and at considerable distance. To-day there are a few playgrounds, established through the efforts of private associations.

If there are the right kind of parents in the home, all may be well. If not, the boy or girl in the city, village, or open country drifts, and often in the way of least resistance, through the current of amusement.

There should be in every city and village, at least for a certain number of inhabitants, a nonsectarian clubhouse and playground, and these are equally as important, as a means of benefit to humanity, as the school or the church. Here, among others, illustrative lectures demonstrating how to live would be given, and this feature could be made most attractive. There would be boys' and girls' clubs for different ages of children. There would be pool and billiards, and cards and dominoes, a library, reading room and smoking room for men, all under the management of the right man, and this would be the opposition of the gin mill.

In order to keep the young from the saloon something must be supplied that is more attractive and which is not hedged in by sectarianism. The clubhouse, when possible, should have spacious grounds for out-of-door sports, under the direction of play instructors and amusement directors, and these institutions must be maintained by the state and be operative every day in the year. The cities maintain jails, reformatories, sanatoriums, asylums, and alcohol farms, and they are operative every day in the year. They do not work only on Sundays or five 5-hour days in the week. Instead of telling a boy that he must not play ball on Sundays, develop him so that he will not want to play ball on Sundays by giving him something better (provided, of course, that he should not play ball on Sundays).

It is not necessary that entertainment be all absolute play. Various forms of work for both boys and girls may be made most entertaining, and this comes under the heading of "Occupational amusement." There are 168 hours in a week, allowing 10 hours a day for sleep. We have remaining 98 hours. Allow 3 hours a week for church and Sunday-school service and 35 hours for school work, and we have 60 hours a week unoccupied, and it is these unoccupied hours that must be supervised and provided for 9 months in the year. During the 3 months' vacation practically the entire time is in the child's hands, to follow his own inclinations, and here lies the greatest necessity for supervision.

We maintain, at a great expense, commissions and committees for railroads, for labor, for charities, for the insane, for the river and the harbor, for trust investigations, and so on indefinitely. A commission that we need most of all is a "child protective commission." The commission, through its subordinates, would be required to know and to have authority over every child in the State.

It is only by such means that we will ever solve many of the urgent problems before us. Reform amounts to little. Prophylaxis in medicine has for many years been ardently advocated by our honored chairman in his teachings and writings.

Prophylactic measures against crime, degeneracy, and general worthlessness are the means in the hands of the public for the signal betterment of the race.

A close association and observation of many thousand children from the various walks of life covering many years tells me that in each little human soul there is a spark of the divine, which may be sustained, nurtured by kindness, and fanned by love into responsible man or womanhood.

PRENATAL WORK IN CERTAIN AMERICAN CITIES.

ELLEN C. BABBITT, Russell Sage Foundation, Department of Child-Helping, New York City.

The problem of infant mortality should be studied in two distinct periods—first, the mortality of infants under 1 month of age, and second, the mortality of infants over 1 month of age. The United States census of 1910 showed that 37 per cent—more than one-third—of the total infant mortality in the registration area occurred in infants under 1 month of age. The charts, made by John S. Fulton, M. D., the secretary general of this congress, show graphically the influence of antenatal conditions on the mortality before and after birth.[1]

At the suggestion of the Federal Children's Bureau, this report deals with the mortality under 1 month of age and the means of combating it by the instruction and care of expectant mothers. This is by no means a comprehensive report, but merely a summary of characteristic features of certain cities personally investigated. Similar work is being done in other cities.

METHODS OF WORK.

The general methods of the organizations giving instructions to expectant mothers may be stated as follows, subject to some variation in matters of detail:

Medical directors.—The medical director in charge of the prenatal work in the various organizations is generally an obstetrician, though there are some pediatricians who have undertaken this work—men whose social instincts have led them into this special field of preventive medicine.

Nurses.—The nurses carry out the orders of the physicians, or see that it is made possible for the mothers to carry them out. They are graduate nurses chosen for their special fitness and tact. The nurses need also a knowledge of food values. It is not enough to see that food is provided, in cases of special need, by a relief society; the nurse must see that the food supplied is of the right kind to suit the individual need of each mother, as ordered by the physician.

The nurses visit the expectant mothers in some cities once in 10 days, in others once in 2 weeks, and in others once a month.

Clientèle.—The cases are referred to the various organizations doing prenatal work by hospitals, dispensaries, milk stations, social settlements, and by the various charitable agencies. One serious obstacle is that mothers are late in registering, although the effort is to secure enrollment for as long a period preceding delivery as possible.

In some cities printed leaflets are distributed giving plainly stated advice to the expectant mother; but in many cases they are of little value because of difference in languages.

Instruction.—Instruction is usually given by the physician, either individually or in classes, when the mothers attend the clinics or dispensaries, and is followed up by the nurses in the home. The subjects covered are general and antenatal hygiene, including the need of nourishing food and the value of fresh air, the regulation of exercise, clothing and bathing, and the care of the breasts. Also the physician discusses with the mothers the arrangements for the confinement; whether it shall be in the home or in a hospital; the physician having in view, on the one hand, the advantages of hospital care, and on the other, the disadvantages of taking the mother's moral support away from the home.

The danger of overstrain is obviated in some cities by sending in an extra helper to assist with the heaviest part of the work in the home.

The nurse also encourages the mothers to save small sums all through the pregnancy for the extra expenses of the confinement, lest they suffer from having to meet these expenses by depriving themselves of proper nourishment and extra help in the last few weeks. These savings are made in different ways, as in the "penny savings stamp" books used by Miss Strong in Boston in her settlement work in South End House.

STATISTICAL REPORTS.

The plans and methods of the different organizations have not yet been standardized. The work develops according to the spirit and genius of each. The records are not uniform. It has seemed best, therefore, to present the statistics in the form furnished by the several societies.

NEW YORK CITY.

Caroline Rest.—To the honored chairman of this section, Dr. A. Jacobi, belongs the credit of initiating the movement in New York City. In 1907 Dr. Jacobi called the attention of a group of people to the need of instruction and special care for the mothers of the very poor with newborn babies. This led to the founding of Caroline Rest by Mr. George Schrader, at Hartsdale, near New York. This convalescent home is also a school for mothers, in which, during the weeks following confinement, the mothers are taught how to care for themselves and their babies. It is administered by the New York Association for Improving the Condition of the Poor. The work has proved highly successful. The results quickly revealed, however, that the association had not reached back far enough, and that much more good might be accomplished if the expectant mothers could be instructed and given care. Caroline Rest nurses were therefore assigned for this purpose. The period for which their statistics are available is the year 1908 to 1909. (Period covered, 12 months.)

Mothers:	
Number visited before confinement	489
Number confined by physician in hospital or home—	
Survived	384
Died in or after confinement	6
Total	390
Number confined by midwife—	
Survived	82
Died in or after confinement	17
Total	99

Pediatric department of New York Outdoor Clinic.—In October, 1908, the pediatric department of the New York Outdoor Medical Clinic undertook a systematic care of the expectant mothers registered. From that date until the 1st of October, 1912, 3,300 mothers have been under their care, to whom visits have been paid once a month. Herman Schwarz, M. D., director of the pediatric department, found that 3 per cent of their women registering were under their supervision before the sixth month of pregnancy; 17 per cent were supervised during the sixth month; 30 per cent registered between the seventh and eighth month; and the remaining 50 per cent during the ninth month.

New York Milk Committee.—In August, 1911, the New York Milk Committee began systematic work for expectant mothers. From August 1, 1911, to June 1, 1912, they had two nurses and one field physician, with two medical directors to supervise the work. Since June 1, 1912, they have added four field nurses and a supervising nurse. (Period covered, 12 months.)

Mothers:	
Number visited before confinement—	
Survived	916
Died in or after confinement	1
Total	917
Infants:	
Number living at end of first month[a]	867
Number died during first month	21
Number of stillbirths	18
Number of miscarriages	15
Total	921

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[a] Five pairs of twins.

Infants—Continued.	
Number living at end of first month—	
Breast fed entirely	812
Mixed feeding	25
Bottle feeding entirely	30
Total	867

The deaths under 1 month of age were 23.6 per thousand live births, whereas the mortality of infants under a month of age in Manhattan in general was 40.9 per thousand. The stillbirths reported were 19.6 per thousand, while the stillbirth rate in Manhattan in general was 48.6 per thousand.[1]

New York Diet Kitchen.—The New York Diet Kitchen is organizing prenatal instruction, beginning with the negro mothers. They report an encouraging disposition on the part of these mothers to follow instructions.

BOSTON.

Committee on infant social service.—In Boston prenatal work was organized by a committee on infant social service in the Women's Municipal League, in April, 1909, under the chairmanship of Mrs. William Lowell Putnam. This committee has done most effective pioneer work in standardizing and coordinating the work, in the hope, as Mrs. Putnam has said, "that care during pregnancy will become as much a matter of course as it now is during confinement." The printed reports on this work by the committee are valuable.[3] The period covered by their report is from April, 1909, to August, 1913 (three years and three months).

Mothers:	
Number visited before confinement—	
8 months	1
7 months	1
6 months	4
5 months	8
4 months	37
3 months	143
2 months	391
1 month	579
Total	1,164
Not stated	197
Total	1,361
Number confined by—	
Physician in hospital	953
Physician in home	211
Total	1,164
Lost sight of before confinement	197
Total	1,361

Mothers—Continued.	
Race:	
White	1,116
Colored	48
Total	1,164
Not stated	197
Total	1,361
Infants:	
Number of still-births	32
Number of miscarriages	3
Total	35

Boston Board of Health.—The Boston Board of Health, in 1910, organized a prenatal and postnatal subdivision of its division of child hygiene. The statistics cover the period from September 1, 1911, to May 1, 1912. (Period covered, 8 months.)

Mothers:	
Number visited before confinement	725
Number confined by—	
Physician in hospital	127
Physician in home	49
Midwife	217
Total	393
Not stated	332
Total	725
Infants:	
Number of births	393
Number of deaths	2
Feeding:	
Breast feeding entirely	302
Mixed feeding	32
Bottle feeding entirely	43
Total	377
Not stated	16
Total	393

Pregnancy clinic of Boston Lying-in Hospital.—The pregnancy clinic of the Boston Lying-in Hospital was organized May 5, 1911. The period covered in their report is from May 5, 1911, to December 31, 1911. (Period covered seven months.)

Mothers:	
Number supervised	1,106
Died in or after confinement	6

Mothers—Continued.	
Number confined by—	
Physician in hospital	246
Physician in home	698
Total	944
Not stated	162
Total	1,106
Race:	
Native white	79
Colored	7
Foreign	420
Total	506
Not stated	600
Total	1,106
Number unmarried	17
Infants:	
Full term—	
Number living at end of first month	898
Number died during first month	5
Total	903
Premature—	
Number living at end of first month	3
Number died during first month	4
Total	7
Stillbirths	30
Miscarriages	6
Grand total	946

South End House.—South End House, one of the social settlements, began systematic work in May, 1910. Miss Mary L. Strong, the visiting nurse, has the work in charge. She reports on the plan of work there, as follows:

1. Trying to make all recognized forces doing maternity preparation more effective by supplying the varying details which of necessity have been omitted. (These are generally confidential, spiritual, or home-making details.)
2. Trying to stimulate into existence more of such forces for prenatal work.
3. Trying to put within reach of the fathers and mothers concerned an intelligent understanding of these forces and their value, and trying to help them choose wisely in their preparation for the child's coming. This sort of guidance divides itself naturally into three interests: (*a*) The economic; (*b*) the hygienic; (*c*) the imaginative.

Miss Strong says of the educational work done for fathers:

We try to make him feel that the baby is to be a veritable social investment, into which he must be willing to put thought, time, and money at the start, if he wishes it to be a good and repaying venture. It may be a late date at which to begin eugenics, but if his sense of protective watchfulness can be stirred to conserve the strength of the mother for the good of the child, then he has dignified himself anew.

Statistics of South End House show (period covered, one year):

Mothers:	
Number visited before confinement—	
9 months	6
8 months	10
7 months	4
6 months	27
5 months	20
4 months	10
3 months	6
2 months	1
1 month	4
Total	88
Number confined by—	
Physician in hospital	18
Physician in home	35
Number survived	53
Lost sight of before confinement	10
Pending	25
Total	88
Race—	
Native white	37
Colored	2
Foreign	14
	53
Not stated	35
	88
Number unmarried	2
Infants:	
Number living at end of first month	51
Number died during first month	1
Number stillbirths	1
	53

BALTIMORE.

Maryland Association for the Study and Prevention of Infant Mortality.—In Baltimore parental work was undertaken by the Maryland Association for the Study and Prevention of Infant Mortality February 1, 1912. They visit and instruct all women registered in four leading hospitals. In their report on prenatal work the period covered is from February 1 to September 1, 1912 (period covered, seven months):

Mothers:	
Number visited before confinement—	
8 months	5
7 months	7
6 months	15
5 months	27
4 months	58
3 months	105
2 months	128
1 month	256
Total	601
Number survived	278
Died in or after confinement	5
	283
Died before confinement	3
Lost sight of before confinement	71
Pending	239
Not stated	5
Total	601
Number confined by—	
Physician in hospital	30
Physician in home	241
Midwife	12
Total	283
Race—	
Native white	186
Colored	298
Foreign	117
	601
Number unmarried	116
Infants:	
Full term—	
Number living at end of first month	241
Number died during first month	0
Total	241
Premature—	
Number living at end of first month	2
Number died during first month	3
Total	5
Still births	29
Miscarriages	8
	37
Grand total	283

Infants—Continued.	
Supervised until 1 month old:	
Breast feeding entirely	219
Mixed feeding	11
Bottle feeding	11
Total	241

CHICAGO.

Mary Crane Day Nursery.—In Chicago, the Mary Crane Day Nursery began prenatal work July 22, 1912, for the women of the Hull House neighborhood. Expectant mothers come three days a week, at 9 a. m. They are instructed from 9 to 12, while their older children are at school and their little ones in the day nursery. First the physician, then the nurse, sees the mother. Then comes class work under the domestic teacher. The following is the

Tentative course of instruction.

I. The house. (Talks, discussions, and illustration.)
    1. Essentials in selection of rooms.
        As to neighborhood conditions.
        As to light, air, etc.
    2. Furnishing.
    3. House sanitation.
II. Food. (Talks and practice.)
    1. Composition and function.
    2. Selection, storage, and care.
    3. Preparation of food.
    4. Diets:
        General.
        Invalid. (Special emphasis placed upon their own present needs.)
        Infant.
III. Clothing. (Practical work in sewing room.)
    1. Materials.
    2. Darning and mending.
    3. Making of garments.
IV. Family budgets.
V. Hygiene. (Given by nurse and doctor—talks, demonstration, and practice.
    1. General. (As to cleanliness, air, habits, and so forth.)
    2. Special. (Due to special condition.)
    3. Infant.

At noon the mothers gather with their families for the simple, wholesome meal provided for them. Following this comes a social hour, after which the older children go back to school and the mothers and babies have a rest hour in the open air. Later there is another lesson either in cooking or sewing or hygiene, and then the mothers go home in good season with their children.

ST. LOUIS.

Visiting Nurse Association.—The Visiting Nurse Association of St. Louis has carried on prenatal work as part of its daily routine since January 1, 1911. (Period covered, 19 months.)

Mothers:	
Number visited before confinement—	
8 months	2
7 months	1
6 months	1
5 months	10
4 months	32
3 months	88
2 months	97
Total	231
Time not stated	341
Total	572
Number confined by physician at home—	
Survived	569
Died in or after confinement	3
	572
Race—	
Native white	258
Colored	225
Foreign	89
	572

	Number living at end of first month.	Number died during first month.	Total.
Infants:			
Full term	[a] 534	24	558
Premature	6	3	9
	540	27	567
Stillbirths			9
Total			576
Supervised until 1 month old—			
Breast feeding entirely	393	6	399
Mixed feeding	80	9	89
Bottle feeding entirely	67	12	79
Total	540	27	567

[a] Two sets of twins, both living; one set triplets, 2 living, 1 died first week.

Social service department of Washington University.—In St. Louis the social service department of Washington University undertook, May 1, 1912, to send a nurse to visit all women who register in the obstetrical clinic. The statistics given are for the three months, May, June, and July, 1912. (Period covered, 3 months.)

Mothers:	
Number registered	190
Confined by—	
Physician in hospital	37
Physician in home	55
Midwife	2
Number survived	94
Lost sight of before confinement	42
Not stated	54
	190
Race—	
Native white	27
Colored	42
Foreign	25
	94
Not stated	96
	190
Unmarried	12
Infants:	
Full term—	
Number living at end of first month	94
Number died during first month	1
Total	95
Premature—	
Number living at end of first month	2
Number died during first month	2
Total	4
Stillbirths	3
Miscarriages	4
	7
Grand total	106

MILWAUKEE.

Milwaukee Maternity Hospital.—In Milwaukee the Milwaukee Maternity Hospital and Free Dispensary Association "aims to have the prospective mothers report each week to the dispensary for examination by the physician." Their statistics show (period covered not stated):

Mothers:	
Number confined by—	
Physician in hospital	260
Physician in home	276
	536

Mothers—Continued.	
Race—	
Native white	236
Foreign	300
	536
Number unmarried	93
Infants:	
Full term—	
Number living at end of first month	491
Number died during first month	7
Total	498
Premature—	
Number living at end of first month	13
Number died during first month	3
Total	16
Stillbirths	22
Miscarriages	6
	28
Grand total	542

Visiting nurses' associations.—The visiting nurses' associations in Chicago and in Buffalo have done prenatal work as a part of their regular routine, but their statistical records were not available for this report.

The District Nursing Association in Fall River has been doing excellent work in caring for the expectant mothers during the summer of 1912, of which the records are not as yet in shape for publication, but which show gratifying results.

Statistics.—The statistics as furnished by the various organizations in the different cities are tabulated in different ways, so that it is impossible to give a general brief summary of the results of their prenatal work. It is possible, however, to compare the stillbirth rate and the rate of mortality in the first month among the mothers who were supervised and the general population, both in Boston and New York.[4]

	Stillbirths per 1,000 confinements.	Deaths under 1 month per 1,000 births.
Boston:		
Expectant mothers supervised (by the pregnancy clinic of the Boston Lying-in Hospital)	31.9	10.0
City of Boston	39.8	45.7
New York:		
Expectant mothers supervised (by the New York Milk Committee)	19.6	23.6
Borough of Manhattan	48.6	40.9

This experience in Boston and New York indicates that where expectant mothers have had continued medical supervision, including the work done by the nurses who visit them in their homes, both the stillbirth rate and the rate of mortality in the first month have been appreciably reduced.

At the request of this department, Mr. Ethelbert Stewart has reviewed the statistical statements furnished by the various organizations, and summarized them as follows:

> In the preliminary study of the work for expectant mothers by agencies organized for that purpose in the United States, seven such organizations were visited. There are a number of others, not visited. The length of time for which they were under supervision was obtained from only three of these institutions. The records of these three do not cover the length of supervision of all cases in charge, as they had 2,337 cases under their care, but the length of the supervision is shown for only 1,992. Of those cases, where a definite period of supervision can be shown, the Visiting Nurse Association of St. Louis had 231; the committee on infant social service, of the Women's Municipal League of Boston, 1,160; the Maryland Association for the Care and Prevention of Infant Mortality, Baltimore, 601. Only the Baltimore association has complete records for all of its enrolled expectant mothers. The Visiting Nurse Association of St. Louis, out of 572 cases, gave the time of supervision for only 231. Boston was practically complete, having records for 1,160 out of 1,164. The St. Louis association gave 10 mothers' supervision for five months 32 for four months, 88 for three months, and 97 for two months. The Boston committee gave 37 cases five months' supervision, 143 four months', 391 three months', and 579 two months' supervisory care. Baltimore gave five months' care to 27, four months' to 58, three months' to 105, two months' to 128, and one month's care to 256 cases. Of the 1,992 cases cared for by the three institutions, and covered by their time records, 8 were given eight, 9 were given seven, 24 were given six, 74 were given five, 233 were given four, 584 were given three, 804 were given two, and 256 were given one month's care.
>
> These general facts, so far as could be obtained from the records, are brought out in Table I.
>
> The most striking result of the preliminary survey is the need of uniform records and a due appreciation of the value of statistics as a record of the success of such institutions.
>
> Table II brings out the statistics of confinement, so far as the inadequate records or returns from the records will permit. Not all of the institutions are represented in this table, as the records submitted furnished no data. It should be especially emphasized that there is no way to connect the information in Table I with that in Table II. For instance, Table II shows that of 572 mothers visited in St. Louis, 24 of the children born died during the first month, and 9 were stillborn. But there is no way to connect these facts with the length of prenatal supervision given these mothers. All the way through this lack or correlation between one set of figures and another shows the need of educating those in charge of such institutions to see the value of properly kept statistical data, if these institutions are to become efficient as mortality-reducing agencies.
>
> In addition to the above, Table II takes 3,950 mothers, supervised by five institutions, and attempts to give the number of full-term births, premature births, stillbirths, and miscarriages, the number living at the end of the first month, etc., as clearly as it was possible to develop the facts from the returns

given. That the figures do not agree still further emphasizes the necessity of statistical care in keeping the records of such institutions.

Mr. Stewart adds:

> It would seem to be the part of wisdom to draft a form of statistical record to be submitted to all institutions looking after expectant mothers, and to urge them to keep their records on a uniform basis; at least to urge them to couple up the length of pernatal care with the condition of the child and its subsequent record, such as weight of child at birth, whether breast fed, and so forth. From the viewpoint of a statistician, not much can be said for these institutions until this correlation of prenatal care with subsequent facts is more complete.[1]

TABLE I.—*Number of expectant mothers visited in specified cities and institutions.*

Number of months before confinement.	St. Louis.[a]	Milwaukee.[b]	New York.[c]	Boston.[d]	Boston.[e]	Boston.[f]	Baltimore.[g]	Total.
Eight	2	....	....	1	....	....	5	8
Seven	1	....	....	1	....	....	7	9
Six	1	....	....	8	....	....	15	24
Five	10	....	....	37	....	....	27	74
Four	32	....	....	143	....	....	58	233
Three	88	....	....	391	....	....	105	584
Two	97	....	....	579	....	....	128	804
One	....	....	....	....	....	....	256	256
Total	231	....	....	1,160	....	....	601	1,992
Time not stated	341	507	917	4	1,106	725	....	3,600
Grand total	572	507	917	1,164	1,106	725	601	5,592

[a] Visiting Nurse Association.
[b] Maternity Hospital.
[c] Milk committee.
[d] Committee on infant social service, Women's Municipal League.
[e] Pregnancy clinic, Boston Lying-in Hospital.
[f] Division of child hygiene, health department.
[g] Maryland Association for the Study and Prevention of Infant Mortality.

TABLE II.—*Number of infants.*

Institution and city.	Number of mothers visited.	Full term.		Premature.				Total.
		Living at end of first month.	Died during first month.	Living at end of first month.	Died during first month.	Still-born.	Miscarriages.	
St. Louis[a]	572	534	24	6	3	9	....	576
Milwaukee[b]	507	491	7	13	3	22	6	542
Boston[c]	1,164	....	....	....	....	32	3	....
Boston[d]	1,106	898	5	3	4	30	6	946
Baltimore[e]	601	241	....	2	3	29	8	283
Total[f]	3,950	2,164	36	24	13	122	23	2,347

[a] Visiting Nurse Association.
[b] Maternity Hospital.
[c] Committee on infant social service, Women's Municipal League.
[d] Pregnancy clinic of the Boston Lying-in Hospital.
[e] Maryland Association for Study and Prevention of Infant Mortality.
[f] Discrepancies in these figures may be due to pending cases, births of twins and triplets, and to incomplete returns.

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[1] In article on the "Necessity for minute study of the age-incidence of causes of infant mortality," in Proceedings of the American Association for Study and Prevention of Infant Mortality, Vol. I, 1910.

[2] Of all the record forms seen those used by the New York milk committee are the most complete and satisfactory.

[3] The following reprints have been published by the committee: Reports of Boston Prenatal Work, November, 1910; Reports from April to October, 1911: An Experiment in Preventive Work with Mothers and Babies; Prenatal and Postnatal; Prenatal Care and its Effect in Supplanting the Midwife, from the Point of View of what Laywomen can Accomplish, by Mrs. Putnam, 1911.

[4] It is to be noted that the New York Milk Committee takes all cases, those attended by midwife as well as those under medical care, and that the period covered in its report is from August 1, 1911, to August 1, 1912. The pregnancy clinic of the Boston Lying-in Hospital report covers only those cared for in the hospital or by the clinic, and the period covered in their report is from May 5, 1911, to December 31, 1911.

INFANT MORTALITY AND ITS RELATION TO THE EMPLOYMENT OF MOTHERS IN FALL RIVER, MASS.[1]

Mr. CHAS. H. VERRILL, United States Bureau of Labor.

It has often been the subject of comment both here and in other countries, notably in England, that in cities where a large proportion of the women are industrially employed a high rate of infant mortality—that is, under 1 year—is almost always found. Nearly all of the cities which are centers of the textile industries are conspicuous for a high mortality at all ages, and especially for a high mortality under 1 year. Because of this almost constant relation of the extensive employment of women and a high infant mortality, it has often been assumed that the excessive infant death rates in industrial localities are chiefly due to the industrial employment of the mothers.

In order to test the validity of this assumption or to ascertain the real causes of the high infant mortality in such cases an investigation in detail of the conditions in a textile city where the industrial employment of women is almost exclusively in that industry seemed the most feasible method. Of all American textile cities, Fall River seemed to be the most suitable for such a study. In 1905 nearly 17,000, or 38.6 per cent, of the women 10 years of age and over were gainfully employed, and nearly 13,000, or 29.8 per cent, were employed in cotton mills. Of this number approximately one-third were married or widowed. The death rate at all ages in Fall River for the 10-year period 1900 to 1909 was 20.3 per 1,000 of the population, and in 1908 it was 20.5. In the same 10-year period, out of every 100 deaths 38.4 were those of children under 1 year, and in 1908 36.6 per cent were children under 1 year. The general death rate, it should be noted, was one of the highest prevailing in any northern city, and the same is true of the percentage of deaths under 1 year. The birth rate also was extraordinarily high, being 43 per 1,000 of population in 1908.

The striking feature of the Fall River infant mortality figures, not only in 1908 but in each year of the 10-year period 1900 to 1909 as well, is the great number of deaths due to diarrhea, enteritis, and gastritis, this group of causes being accountable for 38.3 per cent of all deaths under 1 year in 1908 and for 36.7 per cent during the 10-year period.

The main question for investigation then was whether the high infant mortality in Fall River is due directly or indirectly in an important degree to the industrial employment of mothers. Obviously such an investigation called for a study of the causes of death among the children of mothers employed outside the home in comparison with the children of mothers at home. The effect of the mother's work outside the home and of the withdrawal of the mother's care, if the effect was at all marked, should be apparent from a comparison of the deaths due to various causes among the two classes of children.

For the purposes of the investigation the year 1908 was selected. Copies were made of the official records of all children dying under 1 year from any cause in Fall River, and of all stillbirths. Visits were then made to the homes of the children by experienced agents of the Bureau of Labor,[2] and detailed inquiries were made concerning the employment of the mother, the time of discontinuing work before the birth of the child, the time of resuming work after the birth of the child if work was so resumed, the character of the feeding of the child, the care given to the child, especially during any absence of the mother at work, and various other matters tending to throw light in any way upon the direct or indirect causes of death. Much difficulty was found in tracing some of the families and in securing accurate information from the mother and other members of the family. Doctors were interviewed when possible for supplementary information.

Of the 859 children dying under 1 year in Fall River during 1908 the desired particulars were obtained concerning 580, and of the 227 stillborn children recorded particulars were obtained concerning 165. Of the 580 children dying under 1 year whose families were interviewed it was found that in the case of 266, or 45.9 per cent, the mothers during the period of pregnancy were at work outside the home, while in the case of 314 the mothers were not at any time during that period at work away from home. Of the 165 mothers of stillborn children who were traced, 69, or 41.8 per cent, had been employed at some time during pregnancy. From 279 of the children born living and for 62 of the stillborn the family could not be found and the information which is here available is therefore limited to the details given in the official records.

The representative character of the cases concerning which detailed information was secured is indicated by a comparison of the causes of death and of the country of birth of the parents of the children. No significant differences were found between the 580 children for whom particulars were obtained and the 279 whose families could not be found.

The first result of a study of Fall River infant mortality figures and a comparison with those of other localities is to establish beyond question the fact that the Fall River rates are excessive. In Fall River the death rate under 1 year per 1,000 births in 1908 was 177.6, while in 1910 in the Borough of Manhattan it was 135, in Boston 126, in England and Wales (in 1908) 120,[3] and in Blackburn, England, an important English textile city somewhat larger than Fall River, 157 (for a 10-year period).

A comparison limited to a study of the per cent of deaths due to the more important causes quickly shows that the proportion of deaths due to diarrhea, enteritis, or gastritis in Fall River in 1908 was 37 per cent above that in the registration area of the United States in 1908, 37 per cent above that in the Borough of Manhattan, and 46 per cent above that in Boston in 1910, 114 per cent above that in England and Wales in 1908, and 131 per cent above that for 10 years in Blackburn.

Comparison of per cent of total deaths under 1 year due to diarrhea, enteritis, and gastritis in Fall River and in other localities.

Locality.	Per cent of deaths under 1 year due to diarrhea, enteritis, and gastritis.	Per cent of excess in proportion of deaths due to diarrhea, enteritis, and gastritis in Fall River over locality specified.
Fall River, 1908	38.3	
Registration area, United States, 1908	27.9	37
Manhattan Borough, 1910	27.9	37
Boston, 1910	26.3	46
England and Wales, 1908	17.9	114
Blackburn, England, 1901-1910	16.6	131

A comparison on the more exact basis of death rates per 1,000 births makes a very much more unfavorable showing for Fall River, its rate for diarrhea, enteritis, and gastritis being then, for the periods named above, 81 per cent above that for the Borough of Manhattan, 105 per cent above that for Boston, 215 per cent above that of England and Wales, and 161 per cent above that of Blackburn, England, for a 10-year period.

Comparison of death rates per 1,000 births from diarrhea, enteritis, and gastritis, and from nondiarrheal diseases in Fall River and in other localities.

Locality.	Death rate under 1 year per 1,000 births.			Per cent of excess of Fall River death rates under 1 year per 1,000 births over city specified.		
	Diarrhea, enteritis, and gastritis.	Nondiarrheal diseases.	All causes.	Diarrhea, enteritis, and gastritis.	Nondiarrheal diseases.	All causes.
Fall River, 1908	68.1	109.5	177.6	....	....	....
Manhattan Borough, 1908	37.6	97.0	134.6	81	13	32
Boston, 1910	33.2	92.8	126.0	105	18	41
England and Wales, 1908	21.6	98.7	120.3	215	11	48
Blackburn, England, 1901-1910	26.1	130.9	157.0	161	[a] 20	13

[a] Per cent of excess of Blackburn over Fall River rate.

When we compare the death rates per 1,000 births at various ages under 1 year in Fall River and in certain other localities we find that the Fall River rate under 1 month is not excessive, corresponding almost exactly with that for England and Wales, but that at ages over 3 months the Fall River rates are very greatly excessive.

Comparison of death rates at different ages under 1 year per 1,000 births, Fall River, Mass.; England and Wales; and Blackburn, England.

Locality.	Under 1 month.	Under 3 months.	3 months and under 6 months.	6 months and over.	Total.
Fall River, 1908	40.5	72.3	46.9	58.4	177.6
England and Wales, 1908	40.3	64.4	23.6	32.4	120.4
Blackburn, England, 1910	46.1	69.5	25.1	41.4	136.0

The comparisons between Fall River and localities having a more favorable infant mortality rate indicate quite clearly that wherever death rates are excessive the excess is largely to be accounted for by a high rate from diarrheal diseases. This of itself shows that such excessive rates are largely preventable. The additional fact that wherever rates are excessive the greatest differences exist at ages over 3 months shows again that to a considerable extent the high rates are due to preventable causes.

It is possible to throw light upon the situation by turning to English experience, where figures are available covering a period of years, to show the causes where organized effort has resulted in the greatest improvement in the infant death rates. Here, a comparison of the rates from 1901 to 1909 show in the most striking way the reduction in death rates that has been brought about within that brief period. While the greatest reduction, a reduction of 45 per cent (1909 compared with average 1901–1904), has been brought about in death rates from diarrheal diseases, the improvement in practically all of the other causes also is very great and even in death rates from the developmental and wasting diseases of earliest infancy a reduction of 6 per cent has been brought about.

Per cent of reduction in death rates at different ages under 1 year per 1,000 births, between 1901–1904 and 1909, England and Wales, by causes.

Cause of death.	Per cent of total deaths under 1 year due to specified cause, 1901–1904.	Per cent of reduction in death rates, 1909 compared with average, 1901–1904.			
		Under 3 months.	3 months and under 6 months.	6 months and over.	Total under 1 year.
Developmental and wasting diseases [a]	33	5	19	14	6
Diarrheal diseases [b]	19	36	47	50	45
Convulsions	11	31	38	41	34
Tuberculosis (all forms)	4	41	38	31	35
Pneumonia, bronchitis, and laryngitis	17	20	21	16	18
All other causes	17	18	27	23	22
Total	100	15	33	29	22

[a] Includes premature birth, congenital defects, want of breast milk, injury at birth, atrophy, debility, and marasmus.

[b] Includes diarrhea, enteritis, gastroenteritis, gastrointestinal catarrh, gastritis, and gastric catarrh.

The importance in Fall River of the mothers industrially employed outside the home before childbirth, as related to the infant mortality in 1908, is indicated by the fact that of the 580 reported 266, or 45.9 per cent, were so employed, and 314, or 54.1 per cent, were at home.

The importance of the mothers employed outside the home after childbirth and while the child was living, as related to the infant mortality of Fall River, is indicated by the fact that of the 578 reported, 83, or 14.4 per cent, were so employed. This number is subject to further qualification in certain respects, because of the fact that out of this 83 only 41 were at the time just prior to their return to work nursing their children. The other 42 had either never nursed their children or had previously discontinued nursing for reasons having no relation to their return to work.

Work on the part of the mother before the birth of the child, whether in the home or industrially, if involving strain or exhaustion, and especially if continued too near childbirth, might be expected to increase stillbirths, and deaths due to premature birth, congenital malformation and defects, congenital debility, and other diseases, but in less degree.

The causes of death above named are chiefly important in earliest infancy, and if the mother's work before the birth of the child was a seriously injurious influence in any considerable number of cases, that fact should be disclosed in a study and comparison of the deaths of children of the two classes, mothers at home and mothers at work.

A comparison of the children of mothers at home and of mothers at work shows that when all causes of death are considered a slightly greater percentage of the children of mothers at home died during the first week, during the first month, and during the first three months of life. This will be best seen in the following table:

Per cent of deaths from all causes under 1 year occurring under 1 week, under 1 month, and under 3 months, for children of mothers at home and of mothers at work.

Work of mother before birth of child.	Per cent of total deaths under 1 year which occurred—		
	Under 1 week.	Under 1 month.	Under 3 months.
Mothers at home	12.1	24.8	42.9
Mothers at work	10.2	22.2	41.4

A slightly higher percentage of stillborn children is found in the case of mothers at home, 23.4 per cent of the deaths of the children of mothers at home being stillbirths, while for the children of mothers at work only 20.6 per cent were stillbirths. In order to ascertain whether the apparently greater importance of stillbirths among the children of mothers at home is due to the severity of work or to other causes, an attempt was made by inquiry in the home to ascertain in as many cases as possible anything in the work of the mother, her condition, or the conditions in the home to which the stillbirth of the child might be attributed.

Among the mothers at home the stillbirth could be traced to the mother's work in only 9 cases, the cause in 7 cases being the severity or unsuitable character of the work, and in 2 cases the continuance of the work too near childbirth. In addition to the 7 stillbirths due to the character of the mother's work, there were 3 cases where the mother had been employed in the mill during pregnancy but where the stillbirth was due directly to housework at home after leaving the mill. The 7 stillbirths apparently traceable to the mothers' work constituted 12 per cent of the total of 58 mothers at millwork from whom detailed information was secured. Among the mothers at home in 10 cases the stillbirth was apparently traceable to the character of the mother's work, and in 2 cases to its continuance too near childbirth. These 10 cases, it should be said, included 3 cases of mothers who had been employed in the mill but had given up millwork in expectation of childbirth and were engaged only in housework. These 10 cases constitute 13 per cent of the 75 mothers at home (72 at home plus 3 at work in mill and later at home).

Comparing further the per cent of stillbirths traceable to sickness or ill health of the mother, it is seen that the 12 cases among mothers at work constituted 22 per cent of the total for whom reports were received, and the 20 cases among mothers at home constituted 27 per cent of the total mothers at home.

These comparisons would seem to indicate that so far as stillbirths were traceable to a cause, the work of the mother in the mill and sickness or ill health of the mother so employed were not responsible for stillbirths in any greater degree among the mothers at work than among the mothers at home. It is necessary to point out, however, that the facts as presented here can hardly have an exact value, as the causes can not be known of a certainty in all these cases. Moreover, it is probably true that in a number of cases the reported sickness or ill health of the mother at home was due to former employment in the cotton mill, although it is necessary to say that no such case was identified among any of the mothers included in this table. Furthermore, sickness and ill health are not uncommon among women who are not employed in severe labor, either in the factory or in the home, and many such cases are due to obscure causes. Some also, as here, among both mothers at work and mothers at home are due to accidents or improper treatment of previous births.

The condition of the children at birth, which may be taken as an index of the effect of antenatal influences, will be indicated by the percentage of total deaths which were due to the diseases of early infancy (premature birth, congenital malformation, and congenital debility under 3 months). A comparison is made in the following table for the children of mothers at home and of mothers at work:

Per cent of total deaths under 1 year (not including stillbirths) which were due to diseases of early infancy (premature birth, congenital malformation, and congenital debility under 3 months) for children of mothers at home and of mothers at work.

Work of mother before birth of child.	Total deaths, all causes.	Deaths due to diseases of early infancy.				
		Premature birth.	Congenital malformation.	Congenital debility under 3 months.	Total.	
					Number.	Per cent of total deaths, all causes.
Mothers at home	314	16	8	49	73	23.2
Mothers at work outside the home	266	20	4	31	55	20.7
Total	580	36	12	80	128	22.1

From these figures it appears that while deaths from premature birth and congenital malformations together were relatively more numerous among the children of mothers at work, yet when the deaths from congenital debility under three months are added, the children of mothers at home made a distinctly unfavorable showing—23.2 per cent against 20.7 per cent.

The large per cent of children dying from various causes during the early weeks of life suggests that many of the children were not well and strong at birth, due, perhaps, among other causes, to the injurious influence of the mother's work. In the course of the investigation an attempt was made by questioning the mothers of the children to ascertain the number of those dying under 1 year who at birth were not well and strong. Information so obtained, while based in many cases upon the statement of the physician to the mother, would in many other cases rest largely upon the mother's judgment.

Number and per cent of children dying under 1 year (not including stillbirths), from specified causes, who were reported as not well and strong at birth, according to work of mother.

Cause of death.	Total children dying under 1 year.	Children not well and strong at birth.	
		Number.	Per cent.
Mothers at home:			
Premature birth and congenital malformation	24	24	100.0
Congenital debility	77	46	59.7
All other causes	206	45	21.8
Total, all causes	306	115	37.
Mothers at work:			
Premature birth and congenital malformation	24	24	100.0
Congenital debility	53	30	56.6
All other causes	178	51	28.6
Total, all causes	255	105	41.2

According to this table, 59.7 per cent of the children of mothers at home dying from congenital debility were reported as not well and strong at birth. Of the children of mothers at work dying from the same cause, 56.6 per cent were reported as not well and strong at birth. Of the children of mothers at home dying from all other causes (excluding birth and congenital malformations), 21.8 per cent were reported as not well and strong at birth, as compared with 28.6 per cent of the children of mothers at work. Taking together all the children of mothers at home, 37.6 per cent were reported as not well and strong at birth, as against 41.2 per cent of the children of mothers at work.

Apparently, then, antenatal conditions of some kind have resulted in a slightly larger percentage of children not well and strong at birth among the group "children of mothers at work" than among the children of mothers at home. Among the children dying of congenital debility, however, where the fact should be especially noticeable, the percentage is slightly higher for children of mothers at home.

Examining the two groups, "mothers at home" and "mothers at work outside the home" more in detail with reference to the work of the mother, a comparison may be made of the children not well and strong at birth (including both those born living and the stillborn) in relation to the whole number of children dying under 1 year, including stillborn.

Number and per cent of total children dying under 1 year (including stillborn) who were reported as well and strong at birth, not well and strong at birth, and stillborn, according to work of mother before birth of child.

Work of mother before birth of child.	Number.				Per cent.			
	Children well and strong at birth.	Children not well and strong at birth.		Total.	Children well and strong at birth.	Children not well and strong at birth.		Total.
		Born living.	Stillborn.			Born living.	Stillborn.	
Mothers at home:								
At housework only	182	112	93	[a] 387	47.0	29.0	24.0	100.0
At other work	5	1	2	8	62.5	12.5	25.0	100.0
At no work	4	2	1	7	57.1	28.6	14.3	100.0
Total	191	115	96	[a] 402	47.5	28.6	23.9	100.0
Mothers at work outside the home before birth of child:								
At cotton-mill work	136	96	65	[b] 297	45.8	32.3	21.9	100.0
At other work	14	9	4	[c] 27	51.9	33.3	14.8	100.0
Total	150	105	69	[d] 324	46.3	32.4	21.3	100.0
Grand total	341	220	165	[e] 726	47.0	30.3	22.7	100.0

[a] Not including 8, child's condition not reported.
[b] Not including 9, child's condition not reported.
[c] Not including 2, child's condition not reported.
[d] Not including 11, child's condition not reported.
[e] Not including 19, child's condition not reported.

Here, as in the preceding comparison, a slightly larger per cent of the children of mothers at work are found reported as not well and strong at birth. This excess is slightly increased if the comparison be restricted to the two more important classes, "mothers at housework only" and "mothers at millwork." For the former class 53 per cent of the children were reported as not well and strong at birth, and for the latter class 54.2 per cent. The significance in these figures appears to be not in the slight excess of children not well and strong at birth for the mothers at work, but in the fact that for the mothers at home the percentage is practically as high, plainly indicating that if there is an injurious effect of millwork, there must also be in many of these cases an effect almost in the same degree injurious resulting from the work at home. In making this statement it is, of course, necessary to remember that to an extent which can not be accurately measured the group "mothers at home" includes women who were in early life engaged in millwork and are perhaps still subject to the effect upon their health of this earlier work.

Perhaps quite as important as the character of the work of the mother is the length of time before birth of child that the mother stopped work. For the mothers at home the question is difficult of an answer which is of value. A very large number reported that housework was continued up to the day of birth. For very many of these this did not mean severe or long-continued work. For others the hardest kind of work was reported, and premature births and stillbirths could be traced directly to this cause. For the most part, however, the time of discontinuance of work before the birth of the child can not be regarded as significant as here reported in the cases of mothers at home. For the mothers at work, however, conditions are quite different. Here in nearly all cases the mothers were employed outside the home in cotton-mill work, and continued at their usual mill duties up to the day shown in the table.

Number and per cent of total children dying under 1 year (including stillborn) who were reported as not well and strong at birth for mothers at home and mothers at work, according to length of time before birth of child that mother stopped work.

Length of time before birth of child that mother stopped work.	Mothers at home.					Mothers at work outside the home before birth of child.				
	Total children, including stillborn.	Children not well and strong at birth.				Total children, including stillborn.	Children not well and strong at birth.			
		Number.			Per cent.		Number.			Per cent.
		Born living.	Stillborn.	Total.			Born living.	Stillborn.	Total.	
Under 4 days	271	71	59	130	48.0	14	6	5	11	78.6
4 days and under 1 week	5	2	....	2	40.0	2	1	1	2	100.0
1 week and under 2 weeks	33	11	9	20	60.6	11	3	2	5	45.5
2 weeks and under 3 weeks	7	1	3	4	57.1	32	11	10	21	65.6
3 weeks and under 1 month	1	1	....	1	100.0	5	....	3	3	60.0
1 month and under 2 months	5	2	....	2	40.0	31	10	5	15	48.4
2 months and under 3 months	2	1	....	1	50.0	54	14	10	24	44.4
3 months and under 4 months	3	1	....	1	33.3	37	9	8	17	45.9
4 months and under 5 months	1	1	....	1	100.0	28	11	3	14	50.0
5 months and under 6 months	1	....	1	1	100.0	16	6	3	9	56.3
6 months and over	9	5	....	5	55.6	73	28	11	39	53.4
Total	338	96	72	168	49.7	303	99	61	160	52.8
Time of stopping work not reported	64	19	24	51	79.7	21	6	8	14	66.7
Total	[a] 402	115	96	219	52.5	[b] 324	105	69	174	53.0

[a] Not including 8 children, condition at birth not reported.

[b] Not including 11 children, condition at birth not reported.

For the mothers at home it will be seen that in 271 out of 338 cases reported work was continued up to within 4 days of childbirth, while for the mothers at work outside the home out of 303 cases reported, 14 worked up to within 4 days, 27 less than 2 weeks, and 64, or 21 per cent of all, less than 1 month. For the mothers at home the per cent of the children who were not well and strong at birth was not higher than the average, even in the group working up to within 4 days of childbirth. For the mothers at work outside the home, those continuing work up to within a month or less of childbirth show an excessive percentage of children not well and strong at birth. In all the groups discontinuing work at an earlier date the percentages were below the average, save in the last two groups, where it was only slightly in excess.

It has appeared from the foregoing tables that in a comparison of the condition at birth of children of mothers at home and mothers at work approximately the same percentages were not well and strong at birth. Inquiries were made attempting to trace, so far as possible, any apparent relation between the child's condition at birth and the mother's work. Such relationship, however, except in a small proportion of cases, is difficult to trace, for the causes responsible for cases of premature birth, congenital malformation, or a condition of weakness at birth are often exceedingly obscure and very complex. It can not be supposed that what is here presented is more than suggestive of the causes which are operating in the two classes, "mothers at home" and "mothers at work," to produce a condition of weakness or ill health in the child at birth.

Of the 302 children dying under 1 year whose mothers were engaged in housework at home, the condition of 53 children not well and strong at birth was traced to an apparent cause. The child's condition in 14 cases was due to injury at birth or difficult birth; in 14 cases to the sickness or ill health of the mother, and in 9 cases to the character of the mother's work. These 9 cases, however, include 5 cases where the mother was employed during pregnancy outside the home, but where it could be stated definitely that the child's condition at birth was due directly to overwork at home after leaving the mill. In these cases the overwork of special importance was heavy washing and lifting in connection with the same.

Of the 243 children of mothers engaged in millwork outside the home, 42 cases of children not well and strong at birth could be traced to an apparent cause. In 15 cases this cause was the sickness or ill health of the mother, in 11 cases it was the character of the mother's work, and in 9 cases where it did not appear that the character of the mother's work was especially unsuitable and injurious, it did appear quite clearly that it was continued so long and so near childbirth as to be directly responsible for the child's weakness or ill health at birth.

Summarizing the results of the study of the effect upon the children of the mother's employment before childbirth, the conclusion must be reached that in Fall River, as indicated by this one year's experience, no marked differences are discoverable between the children of mothers at home and those of mothers at work outside the home. A slightly larger per cent of stillbirths was reported for the mothers at home, but the per cent of the stillbirths which could be traced to the mother's work was the same for mothers at home and for mothers at work. The percentage of total deaths due to diseases of early infancy (indicating prematurity, immaturity, or defects) was higher for the children of mothers at home than for the children of mothers at work. The percentage of children not well and strong at birth (stillbirths included) was almost exactly the same for mothers at home and for mothers at work. It would appear, then, that the conditions which were found existing do not indicate that the work of the mother in the cotton mill before childbirth was producing results noticeably different from the work of mothers at home. It must be borne in mind, however, that the two classes, mothers at work and mothers at home, are not sharply defined and that the group, mothers at home, always includes a considerable number of women who were formerly engaged in millwork and whose physical condition may still be affected in some degree by such earlier employment.

In regard to the relation of the mother's work outside the home after childbirth to the high infant mortality in Fall River, the question of first importance, of course, is, In what proportion of the cases of children dying under 1 year did the mother work outside the home after childbirth, thus depriving the child of the mother's care? The answer to this question will give the measure of the maximum possible effect of the mother's work outside the home after childbirth upon the infant mortality. The results of this investigation show that in Fall River, in 1908, only 83, or 14.4 per cent, of the 578 children dying under 1 year, concerning whom information could be secured, were deprived of the mother's care because of her going to work after childbirth.

Among these mothers who went to work after childbirth nearly all the races are represented, in much the same proportions as in the much larger group of mothers at work before childbirth. While it is apparent from the smaller number of children which they had borne that for the groups, as a whole, the mothers at work before childbirth were younger than the mothers at home, yet among these mothers who went to work after childbirth, in certain cases the average number of children is so large as to indicate women no longer young. Thus, the 18 French-Canadian mothers show an average of 7.1 children, the 6 English mothers 6.8 children, and the 4 Irish mothers 6.3. The Portuguese mothers, 27 in number, showed an average of only 3.4 children. This comparatively low average was no doubt due to the fact that the Portuguese cotton-mill operatives in Fall River are largely recent immigrants, and as most of them came to this country seeking work in the cotton mill it is, of course, to be expected that they are nearly all comparatively young.

It has been shown that only 83, or 14.4 per cent, of the 578 mothers reporting went to work outside the home after childbirth and while the child was living. Of this number, 11 (13.4 per cent) went to work during the first month and 17 (20.5 per cent) during the second month. Of the mothers at home, a great majority resumed work within one month.

In the absence of the mother, where the mother went to work, the care of the child was by the grandmother in 25 cases, by some other relative in 22 cases, and by a friend, neighbor, or hired attendant in 29 cases.

In the table which follows the causes of death of the children of mothers who went to work outside the home after childbirth are shown in comparison with the causes in the case of (1) the children of the mothers who were at home both before and after childbirth, and (2) the children of the mothers who were at work outside the home before the birth of child, but did not return to work after childbirth.

Number and per cent of children dying under 1 year from certain specified causes, classified according to the mother's work before and after childbirth.

NUMBER.

Employment of mother after birth of child and while child was living.	Diseases of early infancy and congenital malformation.	Diarrhea, enteritis, and gastritis.	Convulsions.	Non-tuberculous meningitis.	Pneumonia, bronchitis, and laryngitis.	Tuberculosis (all forms), whooping cough, measles.	All other causes.	Total, all causes.
Mothers at home before birth of child and not going to work	102	[a]106	22	1	51	7	20	[a]309
Mothers at work outside the home before birth of child, but did not return to work after childbirth	67	66	8	1	29	....	15	186
Mothers at work outside the home before birth of child and returned to work after childbirth	13	[b]52	2	....	13	....	3	[b]83
Total	182	224	32	2	[c]95	7	38	[c]580

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[a] Not including 5 children of mothers at home before birth of child who went to work outside the home after childbirth.

[b] Including 5 children of mothers at home before birth of child who went to work outside the home after childbirth.

[c] Including 2 children not reported whether mother returned to work after childbirth.

Number and per cent of children dying under 1 year from certain specified causes, etc.—Continued.

PER CENT.

Employment of mother after birth of child and while child was living.	Diseases of early infancy and congenital malformation.	Diarrhea, enteritis, and gastritis.	Convulsions.	Non-tuberculous meningitis.	Pneumonia, bronchitis, and laryngitis.	Tuberculosis (all forms), whooping cough, measles.	All other causes.	Total, all causes.
Mothers at home before birth of child and not going to work	33	34.3	7.1	0.3	16.5	2.3	6.5	100
Mothers at work outside the home before birth of child, but did not return to work after childbirth	36	35.5	4.3	.5	15.6	....	8.1	100
Mothers at work outside the home before birth of child and returned to work after childbirth	15.7	62.7	2.4	....	15.7	....	3.6	100

Comparing the causes of death of the three classes of children, the striking similarity between the two groups of children whose mothers were at home after childbirth is first to be noted. Diarrhea, enteritis, and gastritis were accountable for 34.3 per cent of the deaths among the children of mothers at home both before and after childbirth, and 35.5 per cent among the children of mothers who were at work outside the home before the birth of child but who did not return to work after childbirth. The deaths from diseases of early infancy constituted 33 per cent in the former group and 36 per cent in the latter group. On the other hand, turning to the children of mothers at work after childbirth, it is found that 62.7 per cent of all deaths were due to diarrhea, enteritis, and gastritis.

It will be noticed that the per cent of deaths due to diseases of early infancy and congenital malformations are much higher among the children of mothers who did not return to work. The explanation of the difference in this latter case is in the fact that most of the children dying from this group of causes died within the early weeks of life before it was possible for the mother to leave the home and go to work.

The high percentage of deaths from diarrheal diseases among children of mothers at work outside the home is not peculiar to mothers native of any one country, but for every country the percentage is in excess of the corresponding percentage among children of mothers at home.

Artificial feeding was much more general among the children of mothers at work than among the children of mothers at home. The same percentage of the children were fed on fresh cow's milk (9.8 per cent), although when we consider those who were given cow's milk and at the same time nursed, a much greater use of cow's milk is found among the mothers at work than among the mothers at home. The use of condensed milk is also more general among the mothers at work than among the mothers at home. The use of condensed milk among the mothers at home also exceeded the use of cow's milk. While 24.4 per cent of the mothers at home admitted giving solid food, among the mothers at work the percentage rose to 40.2.

The relation of the high percentage of deaths from diarrhea, enteritis, and gastritis to artificial feeding is brought out by the excess of the artificial feeding among the children who died from the diarrheal diseases, as compared with the children dying from other causes.

Number and per cent of children dying under 1 year from diarrhea, enteritis, and gastritis who were given each specified kind of food, classified according to mother's work after childbirth.

NUMBER.

Character of food.	Mothers at home after childbirth.			Mothers went to work outside of home after childbirth.			Total.		
	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.
Nursing exclusively	38	111	149	1	....	1	39	111	150
Cow's milk	9	34	43	5	3	8	14	37	51
Cow's milk and nursing	12	12	24	8	2	10	20	14	34
Condensed milk	19	23	42	6	5	11	25	28	53
Condensed milk and nursing	12	15	27	9	5	14	21	20	41
Proprietary foods	9	9	18	....	....	....	9	9	18
Proprietary foods and nursing	20	8	28	3	2	5	23	10	33
Other foods (usually solid foods) with any or all of preceding	12	10	22	7	5	12	19	15	34
Other foods (usually solid foods) with any or all of preceding and nursing	35	50	85	13	8	21	48	58	106
Total	166	272	438	52	30	82	218	302	520

PER CENT.

Character of food.	Mothers at home after childbirth.			Mothers went to work outside of home after childbirth.			Total.		
	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.	Deaths from diarrhea, enteritis, and gastritis.	Deaths from other causes.	Deaths from all causes.
Nursing exclusively	22.9	40.8	34.0	1.9	....	1.2	17.9	36.8	28.8
Cow's milk	5.4	12.5	9.8	9.6	10.0	9.8	6.4	12.3	9.8
Cow's milk and nursing	7.2	4.4	5.5	15.4	6.7	12.2	9.2	4.6	6.5
Condensed milk	11.4	8.5	9.6	11.5	16.7	13.4	11.5	9.3	10.2
Condensed milk and nursing	7.2	5.5	6.2	17.3	16.7	17.1	9.6	6.6	7.9
Proprietary foods	5.4	3.3	4.1	....	....	....	4.1	3.0	3.5
Proprietary foods and nursing	12.0	2.9	6.4	5.8	6.7	6.1	10.6	3.3	6.3
Other foods (usually solid foods) with any or all of preceding	7.2	3.7	5.0	13.5	16.7	14.6	8.7	5.0	6.5
Other foods (usually solid foods) with any or all of preceding and nursing	21.1	18.4	19.4	25.0	26.7	25.6	22.0	19.2	20.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

The children of mothers at work, when compared with the children of mothers at home, show an excessive percentage of deaths from diarrheal diseases, regardless of the character of the food, suggesting that a lack of care or improper care, as well as the difference in the feeding, played an important part. This is shown in the following table:

Per cent of total deaths due to diarrhea, enteritis, and gastritis among children given each specified kind of food, classified according to mother's work after childbirth.

Character of food.	Mothers at home after childbirth.			Mothers went to work outside the home after childbirth.			Total.		
	Deaths, all causes.	Deaths from diarrhea, enteritis, and gastritis.		Deaths, all causes.	Deaths from diarrhea, enteritis, and gastritis.		Deaths, all causes.	Deaths from diarrhea, enteritis, and gastritis.	
		Number.	Per cent of deaths, all causes.		Number.	Per cent of deaths, all causes.		Number.	Per cent of deaths, all causes.
Nursing exclusively	149	38	25.5	1	1	100.0	150	39	26.0
Cow's milk	43	9	20.9	8	5	62.5	51	14	27.5
Cow's milk and nursing	24	12	50.0	10	8	80.0	34	20	58.8
Condensed milk	42	19	45.2	11	6	54.5	53	25	47.1
Condensed milk and nursing	27	12	44.4	14	9	64.3	41	21	51.2
Proprietary foods	18	9	50.0	....	....	....	18	9	50.0
Proprietary foods and nursing	28	20	71.4	5	3	60.0	33	23	69.7
Other foods (usually solid foods) with any or all of preceding	22	12	54.5	12	7	58.3	34	19	55.9
Other foods (usually solid foods) with any or all of preceding and nursing	85	35	41.2	21	13	61.9	106	48	45.3
Total	438	166	37.9	82	52	63.4	520	218	41.9

The lowest percentage of deaths from diarrheal diseases uniformly appears among children who were breast fed exclusively.[4] Next to these, children using fresh cow's milk showed much the lowest percentage of diarrheal deaths, the figures being 27.5 per cent against 45.3 per cent for solid food and nursing, the next higher, and 47.1 per cent for condensed milk. The highest, 69.7 per cent, was for proprietary foods and nursing, the next highest being 58.8 for cow's milk and nursing.

When the children of mothers at work are studied a somewhat different order appears, cow's milk exclusively and solid food and nursing both showing a very high percentage of diarrheal deaths. For the former class, however, it should be noted that the figures are rather small, as indeed they are for all the classes in the mothers at work group. It is probable that the much more unfavorable showing for cow's milk here is due to inferior quality and especially inferior care of the milk. A similar explanation may also account for the more unfavorable showing for condensed milk. It is likely that the lack of the mother's care, as well as the lack of her nursing, is an important factor here.

The very considerable number of deaths from diarrheal diseases among children who were given only mother's milk ought not to excite surprise, although it is doubtless unnecessarily large. Even among breast-fed children the channels of possible infection are numerous. Where only breast milk is given and there is no possibility of infection through unclean food, infection might easily be introduced by means of the fingers or articles put into the mouth, both of which would often be unclean from dust or dirt from the clothing, the furniture, or the floor. All this would be true even in homes where a fair standard of living and of hygiene was maintained. The dangers in overcrowded, insanitary dwellings located in insanitary surroundings would be vastly increased.

The Polish mothers led all others in nursing, 55.6 per cent of their children being breast fed exclusively, against 33.6 per cent of the French Canadians and 27.4 per cent of the Portuguese. Only 16.7 per cent of the Irish children were nursed exclusively.

In the use of cow's milk the Polish mothers are in the lead, with 27.8 per cent, the Irish coming next with 22.3 per cent, the Portuguese mothers being last with only 12.1 per cent.

The Irish mothers appear as using condensed milk most generally (38.9 per cent), the Americans being next with 23.6 per cent.

The Portuguese mothers led all others in the use of solid foods, 44.7 per cent of all admitting giving them either with or without breast feeding. A considerable number of cases were also found among the French Canadians and the Americans.

The principal excuses or reasons for not nursing for the 218 mothers at home who nursed a part of the time only or not at all were: No milk or milk deficient, 59.6 per cent, and illness or disability of mother or child, 26.1 per cent. For 14, or 6.4 per cent, it was reported that milk was present, but no good reason for not nursing could be given. For the 81 mothers who went to work who nursed only a part of the time or not at all, the most important cause was naturally the intention to go to work, which was given by 39, or 48.1 per cent. Next in importance as a reason was "no milk or milk deficient," 33.3 per cent. In the case of 11, or 13.6 per cent, it was admitted that milk was present, but no good reason was given for not nursing.

The illness or disability of the mother or child as a reason for not nursing was a much more important cause with the mothers at home than with the mothers at work. This, however, is what one would expect, inasmuch as mothers seriously ill would, of course, be unable to go to work. It is not at all unlikely that a similar reason explains the excess of those reporting no milk or milk deficient among the mothers at home. The degree of ill health might result in a deficiency of milk and also cause the mother to remain at home, even though the incapacity might not be sufficient to cause it to be reported as the main reason for not nursing.

If the two classes, "disinclination of mother" and "milk present, no reason given for not nursing," be regarded as the same, this reason accounts for 8.7 per cent among the mothers at home and 13.6 per cent among the mothers at work.

It is probable that in some of the cases where the mother reported no milk or milk deficient the actual reason for the failure to nurse the child was her own ignorance or disinclination. The experience of physicians has shown that such reports can not be accepted as conclusive, and that in many cases where the mother states that she has no milk for her child a fair trial proves the contrary.

The disinclination of the mother does not appear as an acknowledged reason of failure to nurse the child save in 5 cases (including 3 among mothers at home and not nursing at all). It is almost certain, however, that this was the real reason in others of the 28 cases where milk was present and a more or less unsatisfactory reason for not nursing was given. Among these 28 mothers were 11 who later went to work. The period which elapsed before their going to work in these cases was as follows: Two at two weeks, 1 at three weeks, 4 at one month, 3 at three months, and 1 at four months. In 8 of these cases the excuse given was that the mother expected to return to work within a short time. It is clear that such a reason can not be accepted as expressing the full truth when the return to work was postponed one and even two months. In one case where the return to work took place in three weeks the excuse frankly given was the disinclination of the mother.

"Going to work" was given as an excuse or reason for shortening the period of nursing in only 40 cases, or 13.4 per cent of the total number who nursed only a part of the time or not at all. In these cases the breast feeding which was given for a time was discontinued because the mother went to work outside the home. In the 1 case where the mother went to work but continued nursing exclusively it is clear that the child would be unfavorably affected by the necessarily infrequent feeding. These cases, it may be noted, constituted only 7.9 per cent of the total of 520 for whom information in regard to feeding was obtained. The significance of this percentage is in the fact that it shows what part of the entire number of children had their period of nursing shortened by the fact that the mother went to work outside the home.

To sum up, then, such conclusions as clearly appear from the study of Fall River experience in regard to the relation of the mother's work outside the home after childbirth to the high infant mortality in that city, only 83, or 14.4 per cent of all children dying under 1 year, were found to have been deprived of the mother's care because of her going to work. This per cent represents the extent of the possible effect of the mother's absence from home.

But the extent to which the nursing of the child was affected by the mother's going to work is smaller than even this figure indicates, for in only 41 cases, or 7.9 per cent of all, was the mother's nursing in any way affected by her absence from home, and in the 42 other cases she either failed to nurse because of disinclination or inability or had discontinued nursing for reasons not in any way connected with her return to work.

But while the number and per cent of children affected by the mother's absence from home was small, yet the causes of death among this number, as compared with the causes among children whose mothers remained at home, show strikingly the fatal effect in these few cases of the mother's absence and of the lack of her care and nursing. Thus the proportion of deaths from diarrhea. enteritis, and gastritis among the children whose mothers went to work (62.7 per cent) was over 80 per cent in excess of that of the children whose mothers remained at home (34.6 per cent).

The real significance of this excess will not be fully realized until we recall the figures before given, showing that for Fall River as a whole the death rate under 1 year from diarrhea, enteritis, and gastritis was two or three times what it was in many other localities.

The high infant mortality of Fall River as a whole clearly is not due, except in very small part, to the excessive rate among the children of mothers at work outside the home, for the proportion of deaths due to diarrhea, enteritis, and gastritis, 38.6 per cent of all, for the city as a whole, only falls to 34.6 per cent when the children of mothers at home are taken separately.

What, then, it will be asked, are the causes of the excessive infant mortality in Fall River, an excess already seen to be chiefly in the deaths due to diarrhea, enteritis, and gastritis? The causes of the excessive mortality under 1 year in Fall River among the children of mothers at home are to be found in the absence of nursing and in the improper feeding and improper care, of which there are many examples. The much higher mortality among the children of the mothers who went to work after childbirth is plainly due chiefly to the greater extent of the absence of breast feeding and of the improper feeding and the additional evil influence of the withdrawal of the mother's care.

Among the mothers at home only 34 per cent of the children were nursed exclusively, while 24 per cent were given solid food, and for 16 per cent condensed milk was the principal food. Among the children of the mothers who went to work only 1.2 per cent were nursed exclusively, while 40 per cent were given solid food, and for 30.5 per cent condensed milk was the principal food. By both classes of mothers condensed milk was used more generally than fresh cow's milk. In over one-third of the cases where solid food was given its use was begun during the first week.

The large percentage of artificial feeding was found to be due to a considerable extent to deficiency of breast milk, which was much more frequent among the mothers at home than among those who went to work, but in many cases among the latter this artificial feeding was not due to a deficiency of breast milk, nor was it in any way a result of the mother's going to work.

The causes of the excessive infant mortality in Fall River may be summed up in a sentence as the mother's ignorance of proper feeding, of proper care, and of the simplest requirements of hygiene. To this all the other causes must be regarded as secondary.

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[1] Based on Report of Commissioner of Labor on Condition of Woman and Child Wage Earners in the United States (61st Cong., 2d sess., S. Doc. No. 645), Vol. XIII, Infant Mortality and its Relation to the Employment of Mothers.

[2] Probably it is important in presenting the results of an investigation of this kind and in this place to emphasize the method of securing the data. For in work of this kind reasonably reliable data can be secured only by visits to the homes, and even then agents of experience and judgment must be employed. The three agents who were engaged in the collection of the data in this investigation had had considerable previous training in the field work of the Bureau of Labor, and one of them, Dr. Laura M. Keisker, in immediate charge of the field work, was also a physician of experience.

[3] For comparison with the Fall River figures of 1908 those for England and Wales in the same year are taken. In 1909 and 1910 the rates for England and Wales were considerably lower than in 1908, namely, 108.73 and 105.44, respectively, per 1,000 births, and the death rates from diarrheal diseases were correspondingly lower (12.64 in both 1909 and 1910). For Manhattan Borough and for Boston figures for 1910 were taken as likely to be more nearly correct than those of earlier years. The rates in 1908 in these cities were: Manhattan Borough, 136; Boston, 149.

[4] The exception among children of mothers at work may properly be ignored in this connection, as there was only a single instance.

THURSDAY AFTERNOON, SEPTEMBER 26, 1912.

FIELD WORK IN TUBERCULOSIS.

MARY E. LAPHAM, M. D., Highlands Camp Sanatorium, Highlands, N. C.

It is, of course, unquestioned that tuberculosis is the greatest menace to the health and development of the human race, and within recent years campaigns for its eradication have been inaugurated and carried on not only by the medical profession, but by societies organized among the laity for the prevention and cure of the disease. We have each year in a great many of the large cities Tuberculosis Day, upon which funds are solicited to aid in the fight, and State and municipal authorities support camps and sanitariums for those unable to bear the burden of treatment in private institutions.

All these efforts are, however, directed toward the eradication of manifest tuberculosis, and the prevention of infection, by these manifest cases, of other individuals not supposed to be infected. Practically no steps are being taken to discover the concealed but active cases of tuberculosis which are constantly with us drifting, for lack of discovery and proper care, surely into manifest cases, which may not be discovered until they have progressed so far that the life of the patient is in immediate danger.

We regard the danger from tuberculosis as comparable to that from other contagious diseases, as smallpox, for instance; and if there is no consciousness of exposure there is no thought of danger. We do not fear tuberculosis without proximate cause any more than we do smallpox.

Hospitals and pathological institutes tell another story. There we learn that from infancy to old age tuberculosis is always with us; that in one form or another it influences our development in every conceivable way, morally, mentally, and physically, and affects us in all conceivable degrees, from harmless, inactive latency to fatal phthisis. The danger from tuberculosis exists from the first breath we draw unto the last. The infection is not vanquished once and for all, but is perpetually resident and must be perpetually resisted, for as long as there is life there is danger from tuberculosis, and this danger does not come entirely from without, but equally from within.

Manifest tuberculosis as we see and know it is not the beginning, but the end. It is the final manifestation of the activities of the tubercle bacilli. When these first settle down in the lung tissues they may not be able to exercise any of their activities. We have the presence of tubercle bacilli within the lungs, but they produce no tuberculous changes of any extent and no effects either local or general.

This inactive or latent tuberculosis is harmless enough as long as inactive, but the danger is that some day this latency will disappear and tuberculous activities develop. The X-ray may show an apparently harmless and quiescent lesion and yet the nutrition of every part of the body be injured by its presence. Because there are no physical signs in the lungs, we call this condition concealed but active tuberculosis, meaning thereby that we can not ascertain anything from the lungs, and can only detect the infection by its general manifestations and by tuberculin reactions. The existence of concealed tuberculosis may manifest itself only in an alteration in the character, intellect, or physical development of the patient until enough changes have been produced in the lungs to cause physical signs when we have clinical or manifest tuberculosis.

The records of the attacks made upon us by the tubercle bacilli and our resistance to these attacks show that 90 per cent of all children who live to the age of 15 years are infected. What, therefore, is to become of these cases? Some will surely develop into manifest cases and cause the death of the patient; others may survive after a protracted struggle and years of ill health; while the majority will probably never be affected by the infection.

We call this obliviousness to the infection immunity; and the ability to produce and maintain immunity will, in my opinion, be the salvation of the race against the dread pest of tuberculosis.

How, therefore, are we to produce this immunity? The majority of those infected will immunize themselves and maintain this immunity throughout life. We will recognize and combat those that develop into manifest cases after they have become manifest, which, in a great many instances, will be too late, but nothing is now done for the majority of concealed and latent cases. We see only those failing to produce or maintain immunity after the failure has become obvious as a manifest case, but these are nothing compared with the number of lives beset with difficulties and bad health because of the unsuspected presence of tubercle bacilli, poisoning their very springs of existence.

The ability to produce and maintain immunity varies, of course, with the conditions of life, the general health, and the strain to which the individual is subjected. Because of school, parties, and dancing, the child is tired out. There is not time in the morning for breakfast, and little appetite for it, because the child was up late the night before. At school a cold luncheon is perhaps taken, and after school the dinner "put up to keep warm" does not seem very appetizing, so that at the end of the school day the child is often completely tired out and insufficiently fed. This is repeated day after day, and as a consequence, tired with study, insufficiently fed, with no attention paid to rest, one school girl after another goes dancing to her doom.

Primarily, it is not the fatigue and lack of food, rest, and fresh air that is responsible for her downfall. The primary underlying fault is the inability of the individual to produce and maintain an immunity that under any and all conditions will triumph over this active but concealed tuberculosis.

We see plenty of children exposed to precisely these same conditions, but they do not succumb because their immunity protects them. This flaw is more or less pronounced among our children, but it does not show until developed by strain. In all probability these cases furnish the material for the future crops of manifest tuberculosis. It can not be too greatly emphasized that the degree of immunity at any particular moment is a very uncertain quantity in this class of cases. Success or failure is not decided at any one time, but may alternate from infancy to old age. One attack after another may be more or less successfully resisted and clinical tuberculosis not appear until 30, 40, 50, 60, or 70 years of age, or not at all. Just as we see immunity raised and lowered again and again in manifest tuberculosis, so does it vary in concealed cases. The inability to produce a complete and lasting immunity in childhood furnishes the supply for the tuberculosis victims of the future. If we could detect these concealed cases in childhood and establish this immunity that is so natural to most of us. we would thereby accomplish a great deal toward the eradication of manifest tuberculosis among adults in the future.

A certain percentage of children fail to produce sufficient immunity. This is bad enough in itself. but the worst feature is that this condition may exist with no striking symptoms to call attention, until it may be too late, as from a miscroscopic nodule the process may extend over a whole lobe or almost over a lung without causing symptoms sufficient to attract attention. If we could detect these cases and put them under proper conditions we could, I believe, raise their immunity until it would. in the vast majority of cases, persist and be a permanent protection.

It is only the remnant in which the immunity fails. If we could bring and maintain this small minority up to where we stand there would be no more tuberculosis. This applies all through life. When the mechanism is imperfect. failure to maintain resistance is imminent at every moment. This failure is undoubtedly present among us in this room at this very moment in a certain number of cases, and because of the lack of manifestations consciousness of the danger will not be aroused until it is actively and disastrously apparent.

This percentage is small, but it is the base of supply from which is drawn the future victims of tuberculosis and it is this fundamental flaw that has to be corrected if the children are to remain unaffected by tuberculosis throughout life. The correction of this fault is the keynote to the fight against tuberculosis.

How can this be done? Eventually we shall confer an artificial immunity just as we do now on typhoid. Among 80,000 troops, stationed under the most diverse circumstances, there have been only five deaths from typhoid from January until June, 1912, and four of these had not been protected by artificial immunity. We can not at present confer artificial immunity against tuberculosis as we can against typhoid, although we are fast approaching the solution of the problem. In the meantime, there are two cardinal points to consider. First, we should detect as early in life as possible the children failing to produce immunity. Second, we should raise this immunity to the highest possible point. The child, unable to protect itself against tubercle bacilli, does not show this inability in any marked way. There are often no gross manifestations, but simply a failure to develop properly. There is a lack of initiative, ambition, and persistency. Failure to keep a normal weight and lack of strength are the commonest and may be the only expressions of concealed tuberculosis, notwithstanding the universal dogma that any tuberculosis of the lungs will so manifest itself as to be capable of detection through a physical examination of the lungs. This belief of the medical profession is entirely erroneous and very dangerous, indeed, and I wish most emphatically to impress this meeting with the fact that an individual may be seriously affected with concealed active tuberculosis and not manifest any symptoms that can be detected by a physical examination of the lungs.

The questions which present themselves for our solution are, therefore—

First. How can we discover the children or adults failing to produce immunity and in whom there exists, of course, concealed tuberculosis, which will almost surely develop into manifest tuberculosis unless discovered and combated in time?

Second. Having discovered these concealed cases, how can we combat them in the most practical and successful manner? Sometimes even manifest tuberculosis is not easily discovered, and it will be readily seen that the discovery of concealed tuberculosis is far more difficult, and particularly so to persons not especially trained in that direction.

I would, therefore, most strongly advocate a campaign by the government of each State, acting through a board of experts especially trained in the detection and treatment of tuberculosis, whose duty it would be to search out concealed as well as manifest cases of tuberculosis, with power to furnish proper care and treatment to all patients unable to procure such from their private resources, and also with sufficient power to enforce this care and treatment among all classes.

The expense of conducting such a campaign is as nothing compared to the loss sustained by the present method of fighting this disease, which never attacks the enemy until it has such a grasp upon the patient as to incapacitate him from work and seriously threaten his very life. The saving to the State in money and human effort, by finding and stamping out these concealed cases, would be in as great proportion as that made by the modern automobile fire engine, which rushes to the scene of trouble in time to smother the little blaze before it has a chance to become dangerous, instead of merely trying to save the surrounding property, as was the case in the old volunteer hand-engine days.

Now we fight only manifest cases of tuberculosis, which is comparable to trying to put out the fire after it has attained the proportions of a dangerous conflagration. What we should do is smother the numberless concealed cases before they have a chance to burst into flame, and this, I believe, can only be done by boards of experts, acting under the express authority of the State.

Best of all, if our National Government would undertake a campaign against tuberculosis, and endeavor to exterminate it by establishing a national board of experts, working in harmony with a board of experts in each State, we could study tuberculosis thoroughly in two ways. First, we could discover the extent of the infection and its relation to human sources. It is now almost universally believed that the infection is due entirely to human dissemination. The source of the infection is regarded as entirely from other cases, and our efforts at preventing the spread of the infection are all based upon this fundamental belief. We must carefully provide for the present victims of the disease, but we must see to it that the future sacrifices are prevented. If we come to believe that extinguishing human sources of infection will not suffice to extinguish the disease, then we will be forced to realize that our only way of preventing future suffering will be to prevent the development of concealed cases of tuberculosis into manifest ones by the conference of immunity, if possible, and by the regular treatment of tuberculosis until that happy day comes. A chain of State laboratories, working under the coordinated guidance of the national board of experts, would be a powerful instrument to detect the cause of tuberculosis and the conference of immunity. If the United States would spend a million dollars this next year in studying the beginnings of tuberculosis, so that these concealed cases would be discovered and saved, the investment would yield such large returns in money saved that all the data and all the educational value acquired would be obtained for nothing. The education of the people and the profession would result in an ability to detect and recognize concealed tuberculosis that in a few years would put the whole question of tuberculosis in an entirely different light. To go on as we are doing is like waiting for uremic convulsions before recognizing kidney disease. To wait for the manifestation of tuberculosis is to allow the activities of the tubercle bacilli full opportunity to do their work, while we do nothing until driven to it by the bitterness of impending death. From latency to clinical tuberculosis we stand idly by and wait, while for years the tuberculous process extends, weaving its threads throughout the lungs until we think the proper time has come for us to undertake the rescue. The proper time is at the beginning and not at the end, before anything has been lost, instead of waiting until there is nothing to save.

THE PRESERVATION OF THE TEETH IN SCHOOLS IN GERMANY, AND THE WORK OF THE GERMAN CENTRAL COMMITTEE FOR DENTAL HYGIENE.

Dr. KONRAD COHN, Zahnarzt Berlin, Germany.

The very great extent to which caries of the teeth is prevalent in childhood we may take at the outset as a well-known fact. Röse and others in Germany proved clearly by their examinations of school children 15 or 20 years ago that about 90 per cent of children suffer from decayed teeth. In reports, too, of school medical men on the state of health of school children one ever comes across the remark that the teeth of the children are, in the great majority of cases, in a rather bad condition. As the statistics in the first examination were simply obtained by counting the decayed teeth, their worth has lately been severely criticized. I therefore proposed that the statistics should be so taken that the condition of the remaining teeth of children should be noted and determined at certain stages during their school career. Fessen, of Strassburg, acting on my suggestion, examined 2,332 eight-year-old children of national schools and 719 children of the same age of higher schools, and found that the condition of the first remaining molars and of the milk molars gave the following results:

In the case of national school children, of the first remaining molars, over 52 per cent were sound, 8 per cent were filled, over 29 per cent were slightly and nearly 8 per cent were completely decayed, and over 3 per cent had been extracted.

In the case of children attending higher schools the condition was better, and showed especially far more signs of dental treatment (16 per cent filled as against 8 per cent in the other case).

The results I obtained in a Berlin girls' school were far more unfavorable. Here the 8-year-old girls had only just under 15 per cent sound first molars, while about 78 per cent were already decayed.

Not one of the children had been treated by a dentist. These facts show how urgent is the necessity of moving against this deplorable state of things, and one can not shut his eyes to the urgency of fighting caries of the teeth, not only from the point of view of health, but also of social interest. It would, however, take far too much time to go into minute particulars of the influence of decayed teeth on the health of mankind. It is not a rare occurrence in Germany for this influence, especially with regard to the condition of nutrition of the child, to be pronounced on the part of medical men of schools as non-existent and incapable of proof. That the condition of children, in spite of bad teeth, can be as good, as regards nutrition, is traceable partly to the fact that stomach and intestines are able, for a long time, to counteract the loss of the teeth. I myself, however, believe that the consequences of a diminished power of mastication, from a nutritive point of view, do not show themselves on the stomach and intestines until much later. How far decayed teeth can be brought into connection with general illness has become a much-debated question, and throwing light on it here would take too long a time. It has been proved that the ulceration of the so common fistulas on the gums is a by-no-means blameless incident, as the statements of Flügge show, who looks upon pus as an important source of very virulent streptococcus, which in manifold ways can exercise its baneful influence on the individual himself or, in consequence of dissemination, also on others. Carbuncles and inflammation of the middle ear, and so forth, appear, according to Flügge, to be caused amongst school children in this way. It is certainly a hygienic duty to put an end to this source of puscoccus amongst children living together in the schools and playgrounds.

The outlet (of the cavity) of the mouth in the pharynx is surrounded by a sort of wreath of lymphatic glands, which act as a protection against the entry of bacteria through the mucous membrane of the mouth.

It is by no means a matter of indifference whether these lymphatic glands be forced to preventive measures in consequence of decayed teeth, and themselves become so worn out in the struggle that when an incursion of very deadly bacteria—tubercle bacilli, for example—takes place they are not capable of their proper power of resistance. In this manner decayed teeth, in consequence of their effect on the mucous membrane of the mouth and on the lymphatic glands near, can make the way easy for tuberculosis into the interior of the body.

As a conclusion to my introductory remarks, I should like to point out further that it is not only of importance from the social point of view, but also from the economical, to take measures for their systematic preservation of the teeth from childhood. Then, too, the adult can not maintain his social position with a neglected mouth and bad teeth, as such a condition is offensive to people who place some value on the external appearance of the body.

Neglect of the care of the teeth in childhood is the cause of greater cost for artificial substitutes in later life. It is therefore clearly indicated then that purely for reasons of economy we should begin even in childhood's days to set to work prophylactically.

I will now devote myself to my principal theme: "The preservation of the teeth in German schools and the doings of the central committee intrusted with its care." The first men who worked in this field, and Jessen in particular, deemed it necessary to open up connections with schools, and laid themselves out to bringing this to pass. The proper care of the teeth by the individual himself is the most important factor, and that this care must be instilled into him as a part of his education. This education can then be best ingrained through the school.

There is now much talk of the care of the teeth in schools, and of school dental clinics, and so forth. Jessen, in Strassburg, sought and obtained connection with the school authorities, and the success obtained there after 10 years' work has made itself decidedly felt and is to be traced partly to the instruction given on the importance of the teeth, and to the admonition on the part of the teachers. In order to introduce this care of the teeth on a large scale in Germany, the German central committee was started at the instigation of Ministerial Director Kirchner. The principal task of the central committee consists in awaking the interest of State as well as of municipal authorities, in the scholastic and medical professions, and finally amongst the people themselves, as to the importance of care of the teeth of children whilst at school. It is not, however, the task of the central committee to fit up school clinics out of its own funds, for this must always be left from the very beginning to the towns themselves.

Local committees are appointed whose duty it is to undertake all local work and to become responsible for the fitting up of the school clinics, and the financing and maintenance of such a clinic is always the business of that particular locality. I now come to the various ways of raising money in the different localities for the purposes of a school clinic. In order to carry out its self-appointed task, the central committee has drawn to itself all those circles which possess any influence to further the scheme, namely, members of State and municipal authorities, members of Parliament, doctors, and particularly school doctors, dentists, teachers, and financial men of high standing.

The organ "Schulzahnpflege" (the Preservation of the Teeth) was also established, appearing at first monthly and now every second month.

A great number of lantern slides dealing with the care of the mouth and teeth have been made and are lent out for purposes of lecturing. The central committee has also, from time to time, had explanatory pamphlets sent to all authorities and also published in the press. It has also taken part in all hygiene exhibitions. It has also from its own funds, as far as possible, directly supported separate local efforts for the purpose of fitting up school dental clinics.

The means at the disposal of the central committee are, however, by no means large. They are composed as follows:

1. Grants from State funds.
2. Single grants from charitable donors.
3. Fees of members.

The balance sheet shows the state of finances for the third year:

	Marks.	Pfennings.	Marks.	Pfennings.	Marks.	Pfennings.
RECEIPTS.						
Proceeds of lecture Apr. 1, 1911			2,539	61		
Corporate members	1,782					
Other members	917					
Life members	200		2,899			
Single grants			6,621	65		
Local committee of Great Britain			194	50		
Other resources, including interest			625	75	12,875	51
EXPENDITURES.						
Salaries and clerical work	1,105					
Traveling expenses	183	50				
Printing and postage	2,052	35	3,340	85		
Grants for school clinics			600			
Investments			4,971	80	8,912	65
Balance					3,962	86

The 31st of May, 1912, then, shows a balance in hand of 3,962,86 marks.

One can see from this that the principal item of expense in extending our cause is that of printing.

If we now ask ourselves how it is that the central committee exercises such influence over towns of Germany which have self-government and which can determine to be completely independent over such institutions as school clinics, we can only attribute this circumstance mainly to the interest felt by the members of the central committee, who are either State or municipal officials.

It is owing to the initiative of Ministerial Director Kirchner that the decrees of the board of education are continually directing attention to the necessity of the care of the teeth during childhood, and we have him alone to thank for this.

The national schools of Prussia are really municipal undertakings, but at the same time are under the direction of the State, and are inspected by high State officials from time to time. On such visits of inspection, Mr. Henschen, of the board of education, has ever drawn attention to the importance of the care of the teeth, and the interest thus shown has borne good fruit, for in the Dusseldorf district school clinics will have been opened in 15 towns by the 1st of April, whilst negotiations are in progress in the case of 8 others. The part the teacher plays in these efforts of the central committee is one of the greatest practical value. Explaining the importance of healthy teeth to the parents and children is only possible with the cooperation of the teacher, and this is attained by scientific lessons, or by making it understood in other ways by childen, or by holding lectures thereon for parents. When a school clinic has already been or is to be fitted up, then the teachers draw the attention of the children to it, and admonish them to make use of it.

The German central committee has the advantage of enjoying the cooperation of school doctors and dentists, and this advantage is by no means an inconsiderable one. One can therefore say with perfect justice that the care of the teeth in schools in Germany has made rapid strides during the last three years. We now have school clinics or institutions of a similar nature in almost 200 towns in which national school children can be treated.

The following questions are of the greatest importance for the carrying out of preservation of the teeth in schools in such a manner as was intended:

1. How will a school clinic best effect the purpose for which it was founded?
2. What will the cost be?
3. What ought such a clinic to accomplish in its work?

The fitting up of school dental clinics in Germany has been done in various ways, as follows:

1. The best and most successful way for a permanent school clinic is to have a municipal one, which is fitted up and maintained at the town's expense. The clinic is to a certain extent an institute belonging to the town itself, just as the schools and hospitals are. The treatment of children is undertaken free, or a small sum is given by parents able to do so. Such clinics are to be found in Strassburg, Charlottenburg, Wilmersdorf, Cologne, and Ulm.

2. The towns give only the rooms, or perhaps also fit them up, and then give a yearly grant, at the same time keeping the conduct of the clinic in their own hands. Funds are raised by making each school child pay a yearly sum of from 50 pfennigs up to 1 mark, the children thereby becoming subscribers to it. This system has been called the "Duisberg," because the town of Duisberg was the first to introduce it on a large scale. The parents are requested to give a sum of money for the health of their children before the fitting up of the clinic. Thus more than two-thirds of the children at Duis-

burg were gotten to pay a sum of 1 mark a year by the first appeal to the parents. Sufficient funds were obtained to guarantee the permanency of the clinic. Care was, however, taken that poor children should be treated absolutely free.

3. A committee is formed in the town whose business it is to see to the fitting up and conduct of the school clinic, and the town then provides suitable rooms and gives a yearly grant. In all other matters the committee is completely independent and has to bear the responsibility of raising the necessary funds for the maintenance of the clinics, regulates the appointment of the dentists, and the general conduct of the clinic. In Berlin, for example, a committee was appointed and the town authorities placed rooms for three school clinics at its disposal with heating and lighting quite free of cost, giving in addition a yearly grant of 25,000 marks.

The dental care of children is not limited to the great towns of Germany, but extends also to the country districts. There is, for example, a school dental clinic at Muncheberg, near Berlin, managed by Dr. Ravatt, which children from the villages around attend, often going two hours in a carriage to have their teeth examined and put in order. At Pilkallen (East Prussia) the following work was done last year (April, 1911–12): 157 extractions, 54 local deadenings of the nerve, 7 scaling the teeth, 55 treatments of roots, and 276 fillings.

The putting into practice of care of the teeth in schools differs very considerably from the care of the children by doctors.

There has for a long time been the institution in Germany of school doctors; these doctors do not treat the children, but only examine them and report as to the state of their health to the parents, who then must have them attended to. Besides this, the school doctors have considerable voice in all questions of hygiene in the school. One has never had much faith that this principle of examination and informing the parents would be of any use as regards the teeth, and, as has been proved, rightly so. For, firstly, the moneyless class have no means to pay for the care of their children's teeth; and, secondly, their education as to the necessity of care of the teeth is not so advanced amongst the lower strata of the people that the information as to the bad state of their children's teeth would produce much effect. As we have already seen, the usual system in German clinics is to have salaried dentists. There are, however, towns, such as Mannheim, for example, which have made an arrangement with local dentists to arrange for the treatment of school children in their private practice. This arrangement has, perhaps, some advantage for the resident dentists, but the German central committee has pronounced itself in favor of the founding of school clinics.

A pecuniary loss through school clinics by the local dentists is quite out of the question, for up to the present the children of the lower classes have never been under dental treatment. On the contrary, they will derive an advantage from them, for children who have been dentally treated during their school days will later find means of looking after and preserving their teeth. We have until now spoken of the treatment of school children, but we have also seen that in many cases the milk teeth in the sixth year are in such a bad condition that hardly many of them can be preserved. Now, the preservation of the milk teeth is of the greatest importance for the health of the teeth later on, and, further, milk teeth capable of mastication are of immense importance for nutrition, especially in childhood, so that the care of them also comes within the range of the efforts of the central committee.

In order to produce the necessary change, the care of the teeth must begin at an age before children are compelled to attend school, and for this purpose children in Strassburg, Berlin, and other places are dentally treated whilst they are in the kindergarten.

An attempt has been made to reckon out a sum per child for the cost of the school clinic, and Jessen has estimated that for 1 mark per child per year the treatment can be carried out. In Darmstadt last year 60 per cent of all the school children were treated, 5,777 in number, and the cost was 1.13 marks per child per year. One can then say that, generally speaking, treatment in the school clinic can be managed for from 1 to 2 marks per child per year. The services of the school clinic are not confined to the treatment of school children, but extend also to the teaching of parents with respect to the care of the teeth. Thus the school children are instructed by paid Sisters of Mercy in the use of toothbrushes and mouth washes.

On can form a pretty fair idea of the work of school clinics in Germany from the fact that in 1911, 22 clinics treated about 102,736 children.

When one considers that we have now about 200 such clinics in Germany, one is able to show a very happy result of progress in this field.

We welcome the spread of the care of the teeth in schools in Germany all the more because of its necessity as regards the care of the sick clubs for the working classes. Up to now the clubs have been obliged to spend large sums for the preservation of the teeth of their members on account of the teeth of adults being in such a bad condition. Now, the care of the clubs, to which the working classes in Germany must belong, forms a continuation of the care in school and even the poorest workman is in a position, through dental treatment, to obtain the benefits of modern hygiene in this field.

DENTAL HYGIENE FOR THE PUPILS OF PUBLIC SCHOOLS.

S. ADOLPHUS KNOPF, M. D., Professor of Medicine, Department of Phthisiotherapy of the Post-Graduate Medical School and Hospital, New York.

To ascertain the status of facilities for dental care with as much accuracy as possible, I sent a letter of inquiry to the superintendents of the 34 important general and special dispensaries of New York City. The four questions asked were as follows:

1. Does your dispensary have a dental department?
2. If so, how many dental surgeons are in attendance, and for how many hours per week and at what times are they engaged in giving their services?
3. Do the patients have to pay for the material for filling teeth, etc., or is it given gratuitously?
4. If there is no dental service attached to your dispensary would you be willing to establish one and arrange special hours for school children, so that the time for visiting the dispensary may not conflict with school hours?

To the 34 letters of inquiry I received 33 answers, which appear in full in this report. Many answers are highly instructive. The summary of them is as follows:

Letters of inquiry sent to dispensaries	34
Answers received	33
Have dental facilities	15
Have no dental facilities	18
Willing to establish dental departments	8
Unwilling or unable to establish one	9
Have asked for suggestions with a view to establishing one	2
Do only extracting	5
Do also filling	7
Do work gratuitously or charge those able to pay	8
Charge for material used	7
Have hours suitable for school children	7
Have hours unsuitable	6
Are willing to increase or change hours	2
Are unwilling or unable to change hours	2
Has 2 hours weekly, with 1 dentist	1
Has 12 hours weekly, with 20 dentists	1
Has 4 hours weekly, with 2 dentists	1
Has 6 hours weekly, with 5 dentists	1
Has 12 hours weekly, with 1 dentist	1
Has 4 hours weekly	1
Has 24 hours weekly, with 1 dentist	1
Has — weekly, with 1 dentist	1
Has 6 hours weekly, with 2 dentists	1
Has 18 hours weekly, with 16 dentists	1
Has 6 hours weekly, with 1 dentist	1
Has 12 hours weekly, with 2 dentists	1
Has 15 hours weekly, with 2 dentists	1
Has 3 hours weekly, with 3 dentists	1
Has 2 hours weekly	1

Answers to Questions I to IV and remarks.

Name.	Question I.	Question II.	Question III.	Question IV and remarks.
Amity Dispensary and Jones Memorial Clinic, 308–312 West Fifty-fourth Street.	Very fine dental department.	One dental surgeon; Tuesdays, 3 to 5 p. m.	10 cents for extracting, 25 cents for filling.	A desire to enlarge the clinic. We have demonstrated the great need of dental care of the teeth of school children, some coming from Harlem to us for treatment. But I hope the dentists will not take up this work unless they are paid a salary, or they will soon be in as bad a plight as the medical profession, who do so much in dispensaries and hospitals without compensation—saddling a burden which should be paid for by the public.—A. Ernest Gallant, M. D.
Bellevue and Allied Hospitals, out-patient department, Twenty-sixth Street and First Avenue.	Has dental department.	20 visiting dental surgeons; 2 to 4 p. m. daily, except Sundays.	No charges	Hours are already arranged, so as not to conflict with school hours.—Reported by George O'Hanlon, M. D., general medical superintendent.
Beth Israel Hospital, dispensary, Monroe, Jefferson, and Cherry Streets.	No dental department.			Plans are being considered for the enlargement of our dispensary, and when that is done a dental department will undoubtedly be added to the service.—Louis J. Frank, superintendent.
Cornell University Medical College, dispensary, First Avenue and Twenty-seventh Street.	do			For various reasons, we would prefer not to establish a dental department.—W. M. Polk, M. D., dean and director.
The Demilt Dispensary, Twenty-third Street, corner of Second Avenue.	do			I am afraid not, as the dental department we had has been discontinued.—T. J. Kearns.
Flower Hospital, out-patient department, 429 East Sixty-third Street.	do			We have given consideration in reference to establishing a dental department and will be very happy to receive any suggestions from you.—R. S. Copeland, M. D.
Fordham Hospital, dispensary, Crotona Avenue and Southern Boulevard.	Yes	Two dental surgeons; Thursday and Saturday afternoons.	Gratuitously	The dental clinic is used only for patients in the hospital and dispensary children who come for some other condition.—J. E. Nash.
German Hospital and Dispensary, Seventy-seventh Street and Park Avenue.	Yes	5 dental surgeons; daily from 1.30 to 2.30, except Sundays.	10 cents for those able to pay.	We can not arrange any other hours except those mentioned.—Louis Kortum, superintendent.
Good Samaritan Dispensary, 77 Essex Street.	Yes	1 dentist; daily from 12.15 to 2.15.	We do not fill teeth, only extract.	Question concerning change of hours referred to the board of trustees.—Paul S. Schultz, physician in chief.
Gouverneur Hospital Dispensary, Gouverneur Slip.	Have no dental department at present.			We anticipate having a dental department in the near future; no arrangements have been made as to hours.—Jessie A. Stovers, supervising nurse.
Harlem Dispensary, 108 East One hundred and twenty-eighth Street.	Yes	Mondays and Fridays, 1 to 3 p. m.	10 cents when able to pay; no filling.	I would have to hear what arrangements you can suggest before I can answer the inquiry.—A. Fergess, D. D. S.
J. Hood Wright Hospital Dispensary, One hundred and thirty-first Street and Amsterdam Avenue.	No dental department.			As our hospital is small and we have only emergency work, I doubt very much the advisability of taking on the dental work.—Lucy M. Moore, Superintendent.
Lebanon Hospital Dispensary, Cauldwell and Westchester Avenues near East One hundred and fiftieth Street.	Yes; about to open it.	1 chief, 1 to 5 p. m. daily	Nominal charge for material.	I will be very pleased to give you any more information you may wish after this clinic has been inaugurated.—Wm. Daub, Superintendent.

Answers to Questions I to IV and remarks—Continued.

Name.	Question I.	Question II.	Question III.	Question IV and remarks.
Mount Sinai Hospital Dispensary, Madison Avenue and One hundredth Street.	No dental department.			We are looking forward to the construction of some buildings in the not distant future and may then be able to increase the capacity of our dispensary and to include the dispensary organization departments which are now conspicuous by their absence.—H. Goldman.
New York Dispensary, 145 Worth Street.	Yes	1 surgeon; extracting only.		A repair clinic has been considered, but lack of funds has prevented the establishment; but I know it is the earnest desire of trustees to have one here. I will bring your circular note to the attention of the board.—Dr. Austin W. Hollis, Physician in Chief.
New York Hospital, outpatient department, 8 West Sixteenth Street.	No dental department.			One of our governors is interested in this subject, and I have taken the liberty of referring your letter to him.—Thomas Howell, M. D., Superintendent.
New York Post-Graduate Dispensary, Twentieth Street and Second Avenue.	do.			Several of our teachers are asking that a Dental Department be considered after we get settled down in the new plant, and undoubtedly the institution would be pleased, then, to arrange hours for school children, etc., under such regulations as would be best for all concerned.—Frederick Brush, M. D., Medical Superintendent.
Northeastern Dispensary, 222 East Fifty-ninth Street.	Yes	2 dental surgeons, 3 to 4 daily.	Free	Not answered.
New York Nose, Throat, and Lung Hospital and Dispensary, 229 East Fifty-seventh Street.	Yes	16 surgeon dentists, 1 to 4 daily except Sundays.	Gratuitously	Do.
Northwestern Dispensary, Ninth Avenue and Thirty-sixth Street.	Yes	1 dental surgeon, 12 to 1 daily.	Only extracting, free	Do.
German Poliklinik, 137 Second Avenue.	Yes	2 dental surgeons, 1 to 3 p. m. daily.	No filling done; other treatment free.	Changing hours would entail some loss of patients and likely greatly incommode our dentists. If the city would make some inducement for our dentists to fill teeth or to come at another hour, or both, we would be happy to do extra service for the good of the poor generally.—Thos. W. Busche, M. D., Chairman Executive Committee.
New York Polyclinic Dispensary, 214 East Thirty-fourth Street.	No dental department.			We are now planning the final details of our new building in West Fiftieth Street, which we hope to occupy within the next few months. We will not, at the present time, extend our field of activities. You can easily appreciate that all our resources are being concentrated for the accomplishment of our present undertaking.—John Gunn, Superintendent.
Presbyterian Hospital Dispensary, Madison Avenue and Seventieth Street.	do.			We could not under present dispensary conditions. Lack of space forbids.
Roosevelt Hospital Dispensary, Fifty-ninth Street, near Tenth Avenue.	do.			Not answered.

St. Bartholomew's Clinic, 215 East Forty-second Street.	Yes	2 surgeon dentists, 2 to 4 p. m., daily; Tuesday and Friday evenings, 7 to 8.30 p. m.	10 cents, if they can afford to pay.	Do.
St. Luke's Hospital, outpatient department, Amsterdam Avenue and One hundred and thirteenth Street.	No dental department.			Do.
St. Mark's Hospital Dispensary, 177-179 Second Avenue.	do			We should be glad to establish a dispensary for school children in the department, but unfortunately our dispensary service is already too large for our quarters. If later on we can secure more room, the question of establishing such an important service will receive our earnest attention.—Benj. J. Tilton, M. D., President.
St. Vincent's Hospital, outpatient department, 153 West Eleventh Street.	do			We are not prepared to undertake the expense attached to the opening of a new clinic such as you suggest. Regretting that our resources are not large enough to meet this desirable charity, I am, etc.—Sister Maria Isidon.
Trinity Dispensary, 209 Fulton Street.	do			I am at a lost to see how suitable accommodation could be arranged for a dentist.—Bennett S. Beach, M. D., Physician in Charge.
New York University and Bellevue Hospital Dispensary, Twenty-sixth Street and First Avenue.	do			I desire to say that we do not have such a department and that it is not our intention or desire to attach to the dispensary such a service.—Egbert Le Fevre, M. D., Dean.
Vanderbilt Clinic, Sixtieth Street and Amsterdam Avenue.	Yes	3 surgeon dentists, Mondays, Wednesdays, and Fridays, 9.30 to 10.30 a. m.	A small charge	Not answered.—Chas. B. Grimshaw, Superintendent.
West Side German Dispensary, 328 West Forty-second Street.	Yes	Extracting only, Mondays and Fridays, 4.30 to 5 p. m.	Free; no accommodation for filling teeth.	Consult Dr. Homer Gibney.
Wilkes Dispensary (St. Mary's Free Hospital), 435 Ninth Avenue.	No dental department.			We could not arrange for a dental service under present conditions.—Sister Superior.
New York College of Dentistry, 205 East Twenty-third Street.		9 to 12 daily	Charges for material used.	We treat a large number of children every Saturday, as that day seems to be most convenient for them, and we are always glad to do everything possible for them.—E. B. Tripp, D. D.S., Chief.

A gratifying result of one of my letters of inquiry was an answer received, on April 15, from Dr. Thomas Howell, of the New York Hospital, to the effect that they had now established a dental clinic, which is in operation daily from 9.30 a. m. to 12 m. Tuesdays, Thursdays, and Saturdays. One dental surgeon is in attendance. The patients are not required to pay for the materials for filling teeth, etc.

To the report comprising 16 dispensaries, independent or attached to hospitals, we must add that there exist three dental clinics maintained by the Children's Aid Society. These are kept fully employed with the care of the teeth of the children attending the society's schools. Last but not least, there is one free dental clinic, being the health department's institution. On January 15, 1910, this first free dental clinic, exclusively for the school children of New York City, was opened at 440 East One hundred and twenty-first Street, as a result of the efforts of the Hon. Peter T. Barlow and a number of his friends. The entire amount of money needed to equip and maintain this clinic was contributed with the understanding that the department of health should detail a nurse to have general supervision over the children, and that only those children should be treated who attended the public schools and whose parents were too poor to pay for the treatment. Applicants are visited at their homes by the nurse, who investigates the financial status of the family and determines whether or not free treatment is justifiable. The nurse also assists the dentists during the treatment hours and keeps all cases under supervision, to see that the children return regularly for treatment, and that they are thoroughly instructed in the care of the mouth and teeth.

The clinic proper occupies two rooms, one being used for the patients who are waiting for examinations or treatment, and the other equipped with the necessary appliances, including two dental chairs. Two dentists are regularly employed, and they are both on duty every afternoon from Monday to Friday, inclusive, and on Saturday mornings.

During the first year of its existence this clinic treated 1,129 children. It gave 5,925 treatments, including 4,861 fillings, 1,499 extractions, and 469 cleanings. Each child treated had its teeth put in perfect condition before it was discharged. And what was the expenditure for rendering 1,129 children, at least as far as their dental condition is concerned, healthy, happy, and efficient? The total expenditure, including equipment, was $4,631.31. Deducting the cost of installation ($1,129.61), with slight depreciation of value, the average cost of complete dental treatment for each child was $3.10; including equipment, the average cost per capita was $4.10.

A little over two years ago I read, upon invitation, at the meeting of the dental hygienic conference and exhibit in New York, a little paper entitled "The relation of modern dentistry to the tuberculosis problem." In it I ventured to state that if the condition in New York is typical of the school children in the whole United States, there must be in the schools of this country about 9,000,000 children with bad teeth. How many of these receive treatment? A very, very small percentage, indeed. And what is the result of this neglect of civic obligation of the community toward its children of to-day, the men and women of to-morrow?

In the paper above referred to I expressed the conviction, by which I am willing to stand to-day, that impaired digestion is often one of the first symptoms of tuberculosis, and that this impaired digestion is not infrequently due to a bad condition of the teeth. Ulcerated teeth may give entrance into the bones to tubercle bacilli accidentally inhaled or ingested, or as a result of secondary infection. Furthermore, it is almost impossible to cure tuberculous patients with no teeth or with bad teeth.

But it is not only tuberculosis which is influenced unfavorably or favorably according to the condition of the teeth; a general malnutrition, anemia, and chloro-anemia, malformation of the maxillary bones resulting from the loss of teeth, enlarged and suppurating cervical glands, and many other ailments, can be ascribed to the lack of dental care in childhood. To put it briefly, I would say that bad teeth, decayed teeth, or the loss of teeth during childhood, its concomitant discomfort, pain, depression of spirit, and lack of appetite, produce that physiological poverty which renders the delicate system of the child not only more prone to tuberculosis, to the invasion of the germs of serious, acute contagious diseases, such as measles, diphtheria, scarlet fever, etc., but also more susceptible to nervous afflictions, such as hysteria, chorea, and St. Vitus dance. It must be evident that the mental and physical efficiency of the future citizen is thus seriously impaired because of lack of proper dental hygiene and care in childhood.

To show the immediate results of the bad condition of the teeth in school children, I think I can not do better than to quote the following telling sentences from the very admirable report of the division of child hygiene under the direction of that efficient sanitarian and lover of children, Dr. S. Josephine Baker, of the health department of the city of New York:

> The practical results of this condition upon the school progress of the child is worth considering. There is a distinct loss of time in school, due to local pain and discomfort, and to the many diseases which find their starting point in the neglect of the mouth and teeth.
>
> Dr. Leonard Ayres, of the Russell Sage Foundation, has made a tabulation of the records of the physical examinations of 7,608 children who had been examined by the inspectors of the division of child hygiene. He found that children with defective teeth progressed 6 per cent more slowly in their school

grades than normal children, and that, whereas the average child with no defects completed eight grades in eight years, the average child with defective teeth took 8.5 years to complete the same course.

After a year's work, Dr. Baker reports:

> Owing to the very wide prevalence of defective teeth among school children and the utter lack of facilities in the city for free dental treatment, the department has never been able to obtain proper treatment for these children who so urgently need it. * * * At present the department lays stress upon the necessity of the so-called toothbrush drills, which are given, especially to the younger children, by the nurses in the schools.

The following circular is given to the children:

DEPARTMENT OF HEALTH, THE CITY OF NEW YORK.

INSTRUCTIONS TO PARENTS REGARDING THE CARE OF THE MOUTH AND TEETH.

The physical examination of school children shows that in many instances the teeth are in a decayed and unhealthy condition.

Decayed teeth cause an unclean mouth. Toothache and disease of the gums may result.

Neglect of the first teeth is a frequent cause of decay of the second teeth.

If a child has decayed teeth, it can not properly chew its food. Improperly chewed food and an unclean mouth cause bad digestion, and consequently poor general health.

If a child is not in good health, it can not keep up with its studies in school. It is more likely to contract any contagious disease, and it has not the proper chance to grow into a robust, healthy adult.

If the child's teeth are decayed, it should be taken to a dentist at once.

The teeth should be brushed after each meal, using a toothbrush and tooth powder.

The following tooth powder is recommended: Two ounces of powdered precipitated chalk, one-half ounce of powdered castile soap, 1 dram powdered orris root; thoroughly mix.

This prescription can be filled by any druggist at a cost not to exceed 15 cents.

The child should take the toothbrush and powder to the school and receive instructions from the nurse as to their proper use.

Issued by order of the board of health.

In this very good circular, as well as in the admirable works of Drs. Baker and Ayres, I see, however, no mention of another feature of dental pathology which should appeal more especially to parents. I refer to the irregular teeth which are neither decayed nor otherwise defective, but merely cause a deformation or retarded development of the jaw, which are, however, as disastrous from a pathological point of view as they are deplorable from an esthetic point of view, particularly for young people. A poorly developed jaw may result in additional deformities of the nasal cavity and, of course, also prevent proper mastication. Thus, a deformed jaw is sure to produce serious pathological conditions, involving the respiratory and digestive tracts.

Now, I know, of course, that the treatment of badly placed, deformed, or irregular teeth is a tedious and costly process. Orthodontia (the straightening of irregularities of the teeth) is a relatively new science, and because it takes from six months to a year, and often more, to correct dental deformities, it is at this time a matter which the health department could not undertake.

I would suggest that when the examining school physician or school dentist discovers a condition which can only be corrected by orthodontical treatment he should make the report to the parents, emphasizing not only the pathological but also the esthetic consequences of the noncorrection of irregular teeth. I believe there are but few parents who would not be willing to make all possible sacrifices to have such a condition corrected in time, particularly in young girls, and, for that matter, in boys as well. All parents are anxious to have good-looking children.

What a large field of usefulness and practical philanthropy does this not offer to righ or well-to-do lovers of children! Aside from the purely dental there should be, wherever needed, also special orthodontical clinics where the children of the poor and those of moderate means can receive gratuitously or very reasonably the care which now can only be bestowed upon the children of well-to-do parents.

It is gratifying to be able to note here that, thanks to the devotion and activity of Miss Theora Carter, the president and founder of the Good Cheer Society, an orthodontical clinic for the correction of dental deformities of poor children was established in Chicago last year. Miss Carter is at this time advocating a similar movement for "good teeth, clean teeth, and straight teeth," particularly intended for newsboys. Those interested in the work hope to see established ere long a general dental and orthodontical clinic in the Newsboys' Home of New York. Dr. George B. Palmer has already started the movement by giving talks to the newsboys on the hygiene of the teeth.

What can the members of this congress, and particularly those devoted to the hygiene of children, do to ameliorate the present deplorable and almost universal lack of general dental, including orthodontical, facilities for the care of children of the poor? They can make propaganda for this cause of childhood in governmental, medical, dental, and philanthropic circles. No science, no branch of medicine, has made greater strides than dental surgery. While the supremacy of general medical education may not yet be claimed for the United States, and, in fact, according to recent reports by Mr. Abraham Flexner, of the Carnegie Institute for the Advancement of Teaching, does not compare at all favorably with Europe, American dental science has that singular distinction of being considered superior to European dental science. Every large European city has its American dentist and he has, as a rule, the élite of the European clientele. I know that European dentists are all eager for a post-graduate course in one of the leading dental colleges of the United States, and that one of their greatest ambitions is to add to their European degree that of an American doctor of dental surgery. They very well know the prestige such a title confers upon them. Would that the time may come, and come before long, when our general medical and surgical teaching institutions in this country will deserve the same prestige which our dental colleges now possess. However, our colleagues of dental surgery should also strive, as they have already done in some sections of this country, to make general dental hygiene a science familiar to the masses. Let them combine with philanthropists like Mr. Barlow and Miss Carter and with schools and health departments such as we have in the city of New York to prevent diseases and deformities in childhood by the multiplication of well-equipped and well-conducted dental dispensaries.

Bad and decayed teeth is a disease of the masses as much as tuberculosis, and as such it must be combated, and particularly in our children at school age. Just as we have societies for the prevention of tuberculosis, for the prevention of venereal diseases, and of alcoholism, representing the three great diseases of the masses, so should we have a society for the treatment and care of children afflicted with dental diseases. This society should be composed of all classes, medical and lay people, just as are the above-mentioned three societies. It would enable everyone who has the children's welfare at heart to contribute according to his means. The funds thus collected would materially aid to defray the expenses of taking care of the school children's teeth. Such a national society, having for its object the care of the teeth of the school children, exists already in Austria (Oesterreichische Gesellschaft fur Zahnpflege in den Schulen). This society is composed of high officials of the Empire, statesmen, pedagogues, physicians, teachers, and people of all sorts of professions and trades. The minimum dues are 2 kronen (about 50 cents), and teachers have to pay only half in order to enjoy membership. Sustaining members pay 50 kronen and founders 1,000 kronen. The Imperial Bank serves as treasurer.

In a recent appeal which this society issued we read the following telling sentences, which would show that our country is not the only one which suffers from this disease of the masses:

> There are 98 per cent of children with decayed teeth in Austria. Decayed teeth is a disease which might justly be called a disease of the masses; the seriousness of this affliction is, alas! not sufficiently recognized; the conse-

> quences of decayed teeth are digestive disturbances, anemia, and general debility, all of which make the child, during its development, particularly susceptible to infectious diseases. Urgent help is needed. The child's oral cavity needs particular care during school age.
>
> Happy are those children whose parents are able to provide them with dental care, but unfortunate indeed are the thousands of children of the poor who are deprived of this privilege. To help these unfortunate children the Austrian Society for Dental Care for School Children has been founded, and now makes a strong appeal for the establishment of dental school clinics.

I do not believe in pauperizing, and parents able to pay for dental care should be made to pay, but the poor should be treated gratuitously, and the money thus expended by the municipality or by private philanthropy will inevitably yield a return in efficiency and diminution of preventable diseases. And, last but not least, by such united efforts in improving deformities of the oral cavity, as well as pathological conditions, the esthetic sense will be awakened where it does not already exist. A good set of teeth is an ornament of which old and young are apt to be very proud. Let us have free and partly free dental clinics; let every child be examined and periodically reexamined for every possible physical and mental deficiency. Let no child pass through life with a pathological or esthetic defect which can be prevented by timely treatment and care. The result of such a provision will be better, healthier, and happier citizens. It is this care of the child of to-day, the man and woman of to-morrow, which must be forever our bugle call in the onward march of civilization.

THE HUMAN MOUTH IN ITS RELATION TO PUBLIC HEALTH.

W. G. EBERSOLE, M. D., D. D. S., Chairman of the Oral Hygiene Committee of the National Dental Association and Secretary-Treasurer of the National Mouth Hygiene Association, Cleveland, Ohio.

The mouth is the principal harbinger and most extensive breeding place for pathogenic microorganic life, and it is the path through which most of those organisms enter the human system.

In it grow and develop those microorganisms which produce dental caries—tooth decay—and dental caries is the most prevalent disease known to modern civilization. It takes courage to make a statement of that kind, when one knows that 90 per cent of his hearers believe that tuberculosis is entitled to the rank which we have given to dental caries. In making this statement I am aware that many of you are ready to take the floor in an attempt to refute this statement.

Within the past two years it has been demonstrated beyond any question that 96 to 98 per cent of the school children of this land are in need of care and treatment from a dental standpoint. In other words, 97 per cent of the mouths of the school children of this country are in an insanitary or faulty condition. These mouths are not only diseased and filled with pathogenic microorganic life, but are unable to perform their normal function.

For years the health organizations throughout the world have been spending millions of dollars in their efforts to bring to the human family food, water, and air free from microorganic life which would produce pathogenic conditions within the consumer.

Much good has been accomplished, to be sure; but how much have we gained when we have brought food and drink to the consumer, at tremendous cost, and then, at the moment of their actual appropriation to the nourishing of mankind, to have them thoroughly mixed and incorporated with the very microorganisms which our millions have been spent to destroy or eliminate?

We willingly concede that much has been accomplished, but that which has been is infinitesimal as compared with that which might have been accomplished had a few of the millions spent in keeping foodstuffs free from pathogenic microorganic life been spent in giving to humanity food-grinding machinery, healthy and free from pathogenic microorganisms.

Of the 150 or more varieties of microorganisms which inhabit the human mouth many are of the kind for which millions have been spent in an endeavor to prevent their gaining entrance to the human body.

Some of these microorganisms are almost invariably present in the mouth and have been found to grow and develop with remarkable rapidity in this ideal breeding place. You know how the organisms which produce typhoid fever, scarlet fever, diphtheria, pneumonia, and tuberculosis are transferred from one individual to another; and you know the havoc these organisms are capable of. But the microorganisms which produce decay of the teeth are just as readily transferable from person to person and are working greater havoc than all the others put together.

In support of the statements just made let me quote Prof. Osler, who made the following statement before a body of dentists and dental students three years ago. He said:

> You have one gospel to preach and you have to preach it early and late, in season and out of season. It is the gospel of cleanliness of the mouth, cleanliness of the teeth, cleanliness of the throat. These three things must be your text throughout life. Oral hygiene—the hygiene of the mouth—there is not one single thing more important to the public in the whole range of hygiene than that.

Not only do the "tooth-destroying" microorganisms aid in producing breeding ground for other pathogenic microorganisms, but they produce two most favorable conditions for possible infection.

First, by their activities around the necks of the teeth, they produce softened and bleeding gums, which offer an excellent opportunity for infection. Second, by their inroads into the tooth substance, they destroy the dental tissue until the dental pulp is exposed, producing the best and perhaps the most frequent means of infection. A tooth with an exposed pulp, and especially one with a dead pulp, the pulp chamber of which is filled with pathogenic microorganisms, provides the best possible mechanism for infection, because, in chewing, the pulp chamber acts as the barrel of a syringe, and the foodstuffs are forced into the pulp chamber, as a piston, forcing the contents into the soft tissue at the apex of the tooth. The amount of infection which takes place in this way no man can estimate. But, when we consider the enormous number of mouths that have dental lesions, at least 50 per cent of them showing teeth which contain exposed or putrescent pulp, we may be able to explain many of the heretofore "not understood" sources of infection.

During the past three years, it has been my privilege three times to speak from the same platform with Dr. W. A. Evans, ex-commissioner of health of Chicago. The last time we were together he spoke on "The dentist and public health." He said:

> In the first place, the mouth is regarded now more and more as of relation to contagious diseases. About a month ago, I was at the meeting of the American Public Health Association, held in Milwaukee, and a great stress was there put on the relation of the secretions of the mouth, of the cavities accessory to the mouth, to scarlet fever, to diphtheria, and to measles, to which, with perfect propriety, can be added consumption, pneumonia, and common colds. In times past, in considering the care of the person who has had scarlet fever, we paid great attention to the skin. It is recently that we have come to understand that the skin is of minor importance in spreading scarlet fever, if of any importance at all, and that after cases had been held for the customary six weeks or thereabouts in the hospital, had been held until all scaling of the skin had ceased, and then had been returned to their homes, had been returned to the family circle in which there were children susceptible to scarlet fever, a certain percentage of cases would occur as a result of those contacts. Later we came to understand that the child supposed to be clear of contagion was, in reality, spreading contagion or carrying contagion back into that home, and then we came to know that the means by which contagion was carried was the secretion of the mouth and the accessory cavities of the ear, the nose, and the nasal pharynx, that contagion was held in the crypts of the tonsils, in recesses in the mucous membrane, in the secretions of the ear, and then we came to know the possibilities around teeth that had not been properly cleaned and in cavities filled with organic matter which might contain elements of contagion; and what is true of scarlet fever is probably still more true of diphtheria.
>
> The bacilli capable of infection lurk in the crypts of the tonsils, in the mucous membranes, around the roots of teeth, around the gum borders of teeth, in cavities in teeth; and, after these things have been proved, we are forced to confess that, in having allowed such children to go among the other children of a family, contagion has been carried to them through these means which were hitherto overlooked. Probably of greater consequence is the possibility of

the spread of contagion in the cases of pneumonia, common colds, and consumption. The work of the dental profession, the question of teeth cared for and teeth uncared for, is, therefore, a matter of great concern in the prevention of the spread of a contagious disease.

Thus far we have spoken of the mouth and the influence it wields for good or for evil from the hygienic standpoint.

In the medical profession we have specialists who devote their time and attention to every other part of the body, save the mouth. The medical men have sidestepped and left the mouth to the dental men. The medical men have considered the dental men oral specialists; and the dental men have until recently failed to grasp the full responsibility which rests upon them. Most dental men have been tooth specialists instead of mouth specialists. It is only when the dentist realizes his responsibility in the latter capacity that he assumes his true relation to the public health in his community. With oral conditions as we find them, and with the influences they exert upon the public health and general welfare of the human family fully recognized, and with the dental profession alone occupying the field of oral specialists, it to this profession that we must turn for the correction of the faulty conditions which here exist. To the dentist belongs the mission of teaching prevention, and the correction of dental lesions. In teaching prevention, he must do so from two standpoints. First, he must teach that "a clean tooth never decays," and must therefore instruct his patients in the performance of a correct dental toilet. He must also teach that "a lazy tooth becomes in time a rotten one." He must therefore teach when and how to properly use the teeth, that they may not only perform their full duty as related to the general digestive tract, but that they may, in turn, by their proper activity, aid in their own self-preservation. Last and least, it is his duty, when dental lesions occur, to correct or repair them.

Too often, with the dentist of the past, the last has been first and the first has been last; but to-day the many are awakening and giving full thought and consideration to prevention, while correction and repair is assuming its proper secondary position in the scale of importance.

I know of no better illustration of what an important part the mouth plays in the health of the individual than that which has been shown by Mr. Horace Fletcher, a man who at the age of 40 was a physical wreck, being "on the scrap heap," as he puts it. Denied insurance by the insurance companies and condemned to early death by the examining physicians, he has, by the proper use and care of the oral cavity, produced, from a physical wreck at the age of 40, a man who, at the age of 60, can practically double the feats of strength and endurance performed by the athletes of the leading colleges of the world.

The chairmen of the oral hygiene committee of the National Dental Association for 1909–1912 undertook to prove the actual value of properly used and cared for mouths from the standpoint of working efficiency. In the summer of 1910 the 40 children having the worst oral conditions out of an enrollment of 846 pupils in Marion School, Cleveland, Ohio, were selected for the purpose of ascertaining the amount of improvement that might be brought about by correcting the faulty conditions and teaching the proper care and use of the mouth. In selecting these children complete and careful examinations of the mouths were made, and the history and class record of the children taken for six months before treatment began. Two sets of psychological tests were made at the beginning of our experiments to prove the actual working efficiency of the children at the time they were received for care and treatment. They were then given full and complete instruction on how to care for and use the mouth. A nurse took charge of them for the purpose of securing their cooperation, and dental service was furnished to correct all faulty oral conditions. The majority of these children were "repeaters," and many of them were only kept in the school by the activity of the truant officer. Two special meals were served to these children, for the purpose of teaching how to use their teeth properly, and, following the meal, they were instructed how to properly care for their mouths.

Of the 40 children selected, 5 were dropped the first day, because they would not agree to perform the duties which were required of them; and during the year's experiments 8 more were dropped because of failure upon their part to carry out the instructions given.

A remarkable showing was made as a result of these experiments. From the 1st of June, 1910, to the 1st of June, 1911, there was not a single case of illness of any member of the class. The school records, efficiency, attendance, conduct, and physical appearance and condition showed wonderful improvement, while, from a psychological standpoint, the mental tests showed an average improvement of 99.8 plus per cent.

Do not misunderstand this statement; we said that the psychological tests showed an average increase in mental working efficiency for the year of 99.8 plus per cent. We did not say that this increase was due to the correction of faulty conditions of the mouth—in other words, to filling and cleaning the teeth; nor did we say that this increase in working efficiency was all due to correcting faulty oral conditions and teaching the proper care and use of the mouth. A part of this improvement was due to the natural growth and development of the children; but by far the greater part of the improvement was due to correction of the faulty oral conditions found, and to the proper care and use of the mouth. By " care " we mean cleanliness. By " use " we mean the selection of suitable foodstuffs and the proper manipulation of them while in the mouth.

If Horace Fletcher, by a thorough understanding and use of the oral cavity, could change a body that at the age of 40 was a physical wreck to one which, at the age of 60, could double the records of the athletes of that time, is it not reasonable to suppose that, in taking a class of 40 children having the worst oral conditions found among a thousand pupils, correcting faulty conditions and enforcing proper care and use of the mouth, such a percentage of improvement as we have shown here might have been obtained? The showing made by this class was startling indeed, and the greatest shock was felt by the dental profession, which for the first time received definite proof of the importance that the mouth bears to health, strength, and mental efficiency.

Every organization, National, State, or municipal, which has health for its concern, should have members of the dental profession not only in its council, but in its inspection department as well. Think not that there is no need for dental representation in connection with health boards or bureaus, nor that medical men can handle this important phase of hygiene.

The time is coming when medical men will wield sufficient influence to deal with faulty oral conditions, but not now, when the human mouth is the most neglected and ill-kept organ of the body. Medical and dental men must combine and cooperate if the greatest good is to come to the greatest number, and to come to the present generation.

In conclusion, let us call your attention to a few facts that have been long recognized but little understood. For years the physician, in diagnosis, has asked to see the tongue and the throat.

The coated tongue tells a story, but to the physician it is of things that lie beyond the tongue that it speaks, and not of the condition of the tongue itself. The coated tongue tells of lowered resistance and by its appearance may tell something more. But what makes this coating? Microorganic life that lowered vitality has permitted to multiply in great numbers, and the rough surface of the tongue is coated with them.

Kissing has been tabooed—except on stated occasions. The individual communion cup has been adopted, here and there, by the church. The public drinking cup has been forcibly discarded. Antispitting ordinances have been passed in all large cities. But what have we done for the individual whose faulty mouth is a serious handicap?

What the mouth means to the individual has been told in a measure by the experiments on the Marion school class. What has been done for the individual can be done for the public at large.

Let us understand the relations which the mouth bears to the health, and let us concentrate our efforts in teaching the proper care and use of the mouth; and let us do this in the interest of the health, strength, and beauty of the human family.

THE HYGIENE OF CHILDREN'S TEETH.

William H. Potter, D. M. D., Professor of Operative Dentistry, Harvard University.

The physical welfare of children is one of the most important problems of the present time. If the child is to be an effective working machine, each physical part must be in sound condition, and each function in good working order. Until comparatively recent times an incorrect emphasis has been placed upon the function of the teeth. Much stress has been laid upon the part which they play in forming an attractive facial expression and their importance in the production of spoken words. Comparatively little has been said in regard to the necessary part which they play in the preparation of food, so that it can be readily digested and thoroughly assimilated—a preparation of food which means the development and upbuilding of the body and its fortification against the attacks of disease. In order that we may clearly understand just what part the teeth should play in the treatment of food, it is necessary to rehearse briefly the physiology of mastication and digestion.

Foster, in speaking of the mechanism of digestion, says:

> The food, in passing along the alimentary canal, is subjected to the action of certain juices which are the products of the secretory activity of the epithelium cells of the alimentary mucous membrane itself, or of the glands which belong to it. These juices (saliva, gastric juice, bile, pancreatic juice, succus entericus, and the secretion of the large intestine) poured upon and mingling with the food produce in it such changes that, from being largely insoluble, it becomes largely soluble; or they otherwise modify it in such a way that the larger part of what is eaten passes into the blood, either directly, by means of the capillaries of the alimentary canal, or indirectly, by means of the lacteal system.

Now the process of digestion is begun when the central incisor teeth bite off a piece of food of such a size as can readily be accommodated in the mouth. Amongst uncivilized people this function of the central incisors is a very important one, as food comes to the individual in large chunks, not finely divided, as is common in civilization. When a morsel of food has been bitten off, it is carried back into the mouth and then begins the process called mastication.

The food is moved by means of the tongue and the muscles of the cheek to such a position that it can be crushed and ground by the closing of the teeth. This process is repeated many times until the food has the consistency of thick cream and has been thoroughly mixed with the saliva which is abundantly poured out from the salivary glands. An important digestive process begins in the mouth, namely, the conversion of starch into sugar. It is the duty of the saliva to bring about this change, and it can be efficiently made only when the food by thorough chewing is well mixed with saliva. Inasmuch as a large part of our food is composed of starch, the digestion which originates in the mouth is of great importance. When food has been thoroughly chewed and is fit for swallowing, it is passed by an almost involuntary motion into the esophagus, which leads it to the stomach. Here the food is acted upon by the gastric juices. If the food has been imperfectly treated in the mouth—that is, if it has been only slightly chewed and scantily mixed with the saliva—the change of starch into sugar is much delayed, and is imperfectly performed. But the thorough treatment of food in the mouth not alone helps in the digestion of starchy foods.

The proteids, to which class all meat foods belong, are best prepared for the action of the gastric juices of the stomach when well subdivided by the teeth. Moreover, it is a distinct advantage to all kinds of food that it be pulverized and made soft and mechanically unirritating before it is passed into the stomach. When mechanically irritating food is churned about in the stomach there is a real danger that its delicate lining membrane be injured in contact with rough particles of food. It is fair to infer that serious lesions of the stomach, like gastric ulcer, or even carcinoma, may result from this cause.

It can be said, then, of all kinds of food that when well chewed it is well fitted for the digestive processes which are necessary for assimilation, and that food that is not well chewed is not well digested and is imperfectly absorbed as nutrition.

There is, however. a more subtle but no less important way in which the teeth and their use enter into the problem of the physical welfare of the child. It can easily be demonstrated, by a self-imposed experiment, that when food is carefully and thoroughly treated in the mouth, the individual becomes very intelligent as to the kinds of food which can be best eaten, and the quantities of food necessary for the maintenance of the body. Thorough chewing and insalivation make simple foods more attractive and pleasant than complicate foods. A healthy instinct is developed which, without relying upon theories of what is best and not best to eat, naturally chooses the best, that is the best for the proper nutrition and development of the body. But this is not all. A slow and careful treatment of food in the mouth develops an intelligent sense of the quantity of food which should be taken at a given time. The mouth in this respect is a safer guide than the stomach. The common method is for a child to eat until the stomach feels distended. When this has been accomplished the child is said to be "filled up" or to have his appetite satisfied. Distension of the stomach is a common sign that the intake of food should be stopped. If, however, the food is thoroughly chewed the mouth will judge far more intelligently than the stomach as to the proper quantity of food which should be taken. No distension of the stomach will occur, because the intelligent appetite will be satisfied long before the stomach can be overburdened. I dwell upon this point because I believe it is vitally related to the health and development of children. A large part of the disorders of childhood, disorders which interfere with the health, happiness, attendance at school, and general physical development, are produced by disorders of digestion; that is, the child has either eaten too much of a food which is healthful in proper quantities, or has eaten an unhealthful or unsuitable food. If the child can be taught to carefully and thoroughly chew its food, mistakes as to quality and quantity of food will be greatly reduced, and digestive disturbances, with their disabling results, will be proportionately diminished.

The thorough chewing of food not only serves as an important guide to the quantity and quality of food, but it induces a mental state exceedingly favorable to the proper flow of the digestive fluids and the regular motion of the digestive tract. This means better digestion of food, better absorption, less decomposition, less danger from the products of decomposition. Haste in chewing is accompanied usually by a nervous tension which means a scanty flow of digestive fluids and unsatisfactory muscular action of the digestive apparatus.

If the child is to have the physical benefits which come from a thorough digestion and assimilation of its food; if it is to acquire intelligence as to the kinds and quantity of food which are suitable for the development of the body, sound teeth, properly articulated, are absolutely essential. When I say sound teeth I do not necessarily mean teeth which have never decayed, for unfortunately there are only a few persons in any community who have not suffered to a greater or less extent from the destructive process of decay. I mean, however, teeth which have been kept in such repair that their original shape and contour have been maintained—teeth which can be used without the feeling of pain or the slightest disagreeable sensation. If such teeth are correctly articulated—that is, if the upper set meets the under set so as to form an effective crushing and grinding machine, then the child is able to get for itself the physical benefits heretofore described.

There is a third way in which the teeth affect the physical development of the child and that is by being, when diseased, a source of infection to adjacent and remote parts of the body. Decayed teeth, on account of their defective surfaces, not only make a thorough treatment of food in the mouth impossible, but they are the means of producing, developing, and nourishing that which is hostile to the child's physical welfare. In order to make this matter concrete, let us follow the course of caries in a child's sixth-year molar. This tooth is the largest and most important grinding tooth in the mouth. The carious cavity usually makes its appearance in the depression of the crown, just where food has been obliged to lodge after the eating of a meal. This cavity, at first very small, soon becomes large enough to be a constant abiding place for remnants of food, and the numerous bacteria with which all mouths abound. Whereas food deposit can to a considerable extent be removed from the natural surfaces of the teeth, it can not or is not likely to be removed from cavities of decay. Now these pockets of decay may harbor a number of sorts of serious bacteria which frequent the mouth, notably the bacteria of diphtheria, pneumonia, and of tuberculosis. If pockets of decay did not exist—that is, if the teeth presented unbroken contours—harmful bacteria could have a much less favorable resting place in the mouth. It would be possible to reduce their number to a minimum by the ordinary processes of cleansing.

Let us now follow our cavity of decay until it penetrates so deeply that it affects the soft parts occupying the interior of the tooth, parts which are abundantly supplied with nerve fibers. At this point, disabling pain occurs. The affected tooth is thrown out of service and in fact the whole set of teeth, upper and under, must cease to grind food, lest a stray morsel be forced into the cavity of decay, and severe pain be produced. The disabling pain, commonly called toothache, is, if of frequent occurrence and long duration, a serious hindrance to the child's physical development, in that it prevents the proper chewing of food, and depresses the physical force. If we follow the carious process in the sixth-year molar a little further, we shall find a death of the soft tissue inside the tooth, and its speedy decomposition.

When decomposed it becomes a violent irritant to its immediate environment and an inflammatory process is started up which, unless promptly treated, results in an abscess with a discharge of pus into the mouth. A frequent, and in some cases an almost constant, discharge of pus into the mouth is a condition often met with in the case of children. This pus may be a means of infecting adjacent parts, as the tonsils, or, by being swallowed with the saliva, may produce its harmful influence lower down in the course of the alimentary canal. The relation between diseased teeth, adenoid growths, enlarged tonsils, and affections of the ear, is one which is being carefully studied at the present time. Just how diseased teeth affect the parts just named has not yet been fully worked out. In the view of some, a superficial infection occurs, originating from the pathological processes located in and about the teeth, and is carried by the act of swallowing to a location upon the tonsils, or to the entrance to the middle ear, or to the region of adenoid growths. Others believe that most of the infection is transmitted from the depths of the alveolar sockets, and absorbed by the tonsils and other parts from within. As relating to the connection between decayed teeth and enlarged tonsils and adenoids let me quote from the medical report of the town of Brookline, Mass., for the year ending January 31, 1908.

Dr. D. H. Walker, who has charge of the examination of the nose, ear, and throat in the public schools, says:

> I would like to call attention to the relation which I believe exists between carious teeth and glandular enlargement. The effect of the absorption of the products of decayed food and of carious bone upon the tonsils and glands in the immediate vicinity and on the digestive system must be far-reaching. I take the liberty of suggesting that a dentist be appointed to treat such children as can not be treated privately; that such dentist be located in the school building, thereby saving the time of the children.

Having thus discussed the relation of the teeth to the health and physical development of the child in three important particulars, namely, in making possible thorough assimilation and nutrition by means of thorough mastication; secondly, in assisting in a selection of food which is intelligent as regards quality, and more especially as regards quantity (this intelligence being developed in connection with a thorough use of the teeth in the process of mastication and being an important factor in the prevention of overeating, which is a frequent cause of disabling digestive disturbances in children); and thirdly, the important relation between diseased teeth, adenoid growths, enlarged tonsils, and affections of the ear, as well as parts more remote from the teeth, it remains for me to suggest some methods whereby the condition of the teeth of children can be placed on a higher level, and thus the child's general health and physical development be promoted.

The situation must be met, in the first place, by educational methods carried on in the public schools. Children must be taught the function of the teeth, their value in carrying out the digestive processes, and the great loss in efficiency and danger of infection, if they become diseased. This teaching should be extended, if possible, to the home, in order that the parents may supplement the teaching of the school. In Germany they hang upon the schoolroom walls large charts upon which the cardinal facts about the value, use, and preservation of the teeth are displayed. These charts are of the greatest value in the education of the child, and I heartily recommend this form of instruction. An occasional illustrated lecture given in the school building, when scholars and their parents are present, does much to interest the child in the care of its mouth. In addition to these methods, I recommend the use of a small printed slip giving rules for the "Care and use of the teeth," such as I have devised for the schools of the town of Brookline, Mass.

This slip reads as follows:

Directions for the Care and Use of the Teeth.

1. The teeth should be thoroughly brushed after each meal.
2. A tooth powder used on the brush helps to clean the teeth.
3. Candy and crackers should not be eaten between meals; they cause the teeth to decay.
4. The slow and thorough chewing of hard food helps to preserve the teeth and to keep the mouth in a healthy condition.
5. Children's teeth should be examined by a dentist at least twice a year.

This slip, or one of similar import, should be pasted into the inner covering of at least one schoolbook belonging to each child in the primary and grammar schools. If this is done, it will be impossible for the children to grow up in ignorance of the laws of health which relate to the teeth. and it is probable that parents, too, will be much benefited by the printed advice. It ought to be said at this point that decay of the teeth, which is so universal and so hostile to the welfare of the mouth, is to a large extent a preventable disease, and for this reason I lay so much stress upon the educational measures. The cleaner teeth can be kept, the less likely they are to decay. The more thoroughly teeth are exercised by the use of hard foods, the more resistant they are to the forces hostile to them. Amongst uncivilized people there is little decay of the teeth. Decay comes with civilization, which brings soft foods; the excessive use of sugar and starch. To counteract the effects of civilization. we must teach children the thorough chewing of hard foods, which is Nature's way of cleaning the teeth, and we must also teach them the proper method of artificially cleaning the teeth by the use of a tooth brush and a suitable powder. If children will adopt these cleansing methods, decay of the teeth will be reduced to a small fraction of what it is to-day.

In connection with the educational work amongst school children, there must be operative work to stop processes of decay and to relieve pain. Here is the most difficult part of our problem. It is a hopeless task to-day to try to put in order all the teeth of all the school children in the average community. It is hopeless, because there are so many cases of advanced decay. There are not dentists enough in any community to take care of all the public-school children's teeth, even if they devoted their entire time to this service. It is, however, not a hopeless task to treat all cases of incipient decay, and in this way prevent serious decay and obviate the difficulty of treating it. Such a plan has been put in operation in Cambridge, England, and has produced the best results. It was devised by Dr. George Cunningham, of that city. Treatment is begun with children from 6 to 8 years of age. Children of these ages will have only small defects in the sixth-year permanent molars, and probably no defects in other permanent teeth. The small defects are repaired, the children are taught to do their part in cleaning their teeth, so as to minimize decay. These children are inspected twice a year, and the necessary fillings made. The amount of time given to each child is small, because large defects are prevented. It is possible for each operator to treat a large number of patients. Children thus treated are to be kept under examination and treatment through the twelfth year, at which time all the permanent teeth will be in place, with the exception of the wisdom teeth. This system insures a complete set of teeth, with some small defects, which have been suitably filled. The child will also have been taught to take care of its teeth in such a way as to make serious decay unlikely in the future. Then, too, the years of greatest susceptibility to decay will have passed, and the child can safely be left to its own initiative as regards the care of its teeth. It will naturally be asked, What is to be done with school children who are now beyond the ages included in the treatment just described? In the mouths of such children we will find many teeth in a state of advanced decay. To restore such mouths to a normal and healthy state by operative work would take so much time that it is practically impossible. Effective work can only be done upon incipient cases; upon these our efforts should be concentrated. Advanced cases must necessarily be neglected; they will lose many teeth and suffer much pain. There is a certain analogy between incipient and advanced decay of the teeth and incipient and advanced tuberculosis. In the first class treatment is hopeful, in the second, discouraging. But something should be done for advanced cases of decay. Pain should be relieved; dilapidated and badly diseased teeth should be extracted. These operations can be quickly performed, and are a decided benefit to the child. In speaking of operative work for the school child, the question naturally arises, Who is to arrange for this work, and who is to pay for it?

My answer to this question is that if the teeth of school children are to be radically improved, if there are to be large proportions of children in our grammar schools who possess all their teeth without serious defects, then the city or town must establish dental clinics in its school buildings and pay for their maintenance. I visited last summer in the town of Berndorf, Austria, a new school building of the grammar grade, in which four rooms were devoted to a dental clinic. These rooms had an efficient dental equipment; a dentist and a nurse were in attendance every morning during the school year, and the children of that school were not permitted to be physically and mentally handicapped by defective teeth. This is an ideal condition, and worthy of imitation everywhere. It is impracticable to send school children far from their schools or homes for dental treatment. In presenting a plan for the care of the teeth of school children I must allude to a bill which was last year before the Legislature of the State of Massachusetts, namely, a bill to create and legalize the "trained dental nurse." This bill allowed a nurse who was properly trained and who has passed an examination before the State board of dental examiners to examine teeth, to clean teeth, and to make applications for the relief of pain. If this bill, or a similar one, becomes a law it will give us trained helpers who will be of inestimable value in dealing with the problem of defective teeth of school children. One or more dental nurses attached to a school dental clinic could, under the supervision of a school dentist, examine all children, record their defects, clean their mouths thoroughly and often, attend to the teaching of dental hygiene, and thus greatly increase the efficiency of the work and reduce its cost. I have spoken of the necessity of preventing decay of the teeth. There is no one thing which will so effectively prevent decay of the teeth as to keep them clean. This cleaning the child must be taught to do, but, in addition, it is of great advantage if the child can have its teeth cleaned at short intervals by a trained operator. This the dental nurse could do, and thus prevent decay. The expense incurred in the care of the teeth of school children is to many municipalities an insurmountable obstacle. And it always will be, if registered dentists must do all the work in school dental clinics. We need the trained dental nurse to help prevent disease of the teeth, and to minimize the cost of treating what can not be prevented.

I do not wish to be understood as advocating that the municipality assume the cost of the care of all the children in the public schools. There are many children and, perhaps, the majority in the average school, who can afford to consult a private dentist. Such children should be examined at the school dental clinic, their defects noted, and their parents requested to have their mouths put in order. It will be the further duty of the school clinic to follow up these cases and see that the work is done. There are, however, a large number of cases in every public school whose mouths will never be touched, except possibly for the extraction of teeth, unless this work can be done by a school dental clinic or a dental infirmary at a very slight expense or absolutely free. It is unwise to furnish dental services free except in cases of absolute need. If even a few cents are charged for a dental operation the child will appreciate it more on that account and its self-respect will be maintained.

It will, perhaps, be asked why in a city like Boston, which has seven or eight public dental infirmaries, the care of the teeth of school children can not be intrusted to these institutions. They can be relied upon to supplement the work of the school dental clinic. They can treat many of the cases of advanced dental decay which, according to my plan, can not be treated in the school clinic. They can not, however, be relied upon to make accurate examinations of entire schools, nor to institute educational work on dental hygiene, nor to insist upon early treatment of incipient cases. We can not expect them to give that systematic and scientific attention to the prevention of decay which is absolutely necessary if real progress is to be made in the renovation of the mouths of school children.

In conclusion, I would summarize my recommendations as follows:

1. Teach the child that decay of the teeth is to a considerable extent preventable, and instruct the child and its parents how to prevent it.

2. Establish in school buildings school dental clinics in charge of dentists paid by the municipality. Add the services of a dental nurse if the law makes this possible.

3. Begin work upon children before serious decay has occurred in their permanent teeth, and continue work upon these children through the twelfth year.

DISCUSSION.

Dr. Sidney J. Rauh, Cincinnati: While from 75 to 90 per cent of school children have defective mouths, the majority can be made hygienic through very short treatment and educational methods, more especially in the younger pupils. In an "Experimental dental class," conducted in Cincinnati, Ohio, the average was 85 per cent, as compared to 69 per cent in a "control class"; the appearance, attendance, conduct, etc., being relatively improved.

Dr. Bogue. In all the discussions that I have heard on oral hygiene, I have heard nothing about detecting and preventing nasal stenosis and facial deformity through operations on the temporary teeth of young children. The bony system is largely developed through the activity of muscles that are attached to the bones. The bones of the face and jaws are no exception, but they also need the stimulus of proper mastication. The brain of the average child weighs, at birth, 371 grams; at 6 years of age, it weighs 1,360 grams; and at 19 years of age the brain weighs 1,400 grams, a gain of only 40 grams from the sixth to the nineteenth year of life, during which time the body makes its greatest effort of development.

All deformities therefore, whether of the hip joint, club foot, chin, jaws, teeth, nose, or face, should be corrected before the sixth year of life, for much can then be done practically without pain in a comparatively short time and with much greater certainty of success, because it is all accomplished during the years of most rapid growth and nature is aiding all the time instead of being an obstruction.

Dr. Lorenz refuses to replace a dislocated hip joint after 5 years of age, finding the surrounding parts too rigid and unyielding to insure success.

For precisely the same reason operations to prevent small nasal passages, crooked nasal partitions, irregular teeth, a high-arched roof of the mouth, a retreating chin, or a chin that projects like the jaw of a bulldog should all be undertaken and completed, if possible, before the sixth year of life.

Irregular teeth can often be brought into line at this early age by the use of a little curved wire arch no larger round than a pin or by other appliances.

This curved wire can also be made to spread the nasal passages and increase their size from before backward, thus obviating the necessity for breathing through the mouth.

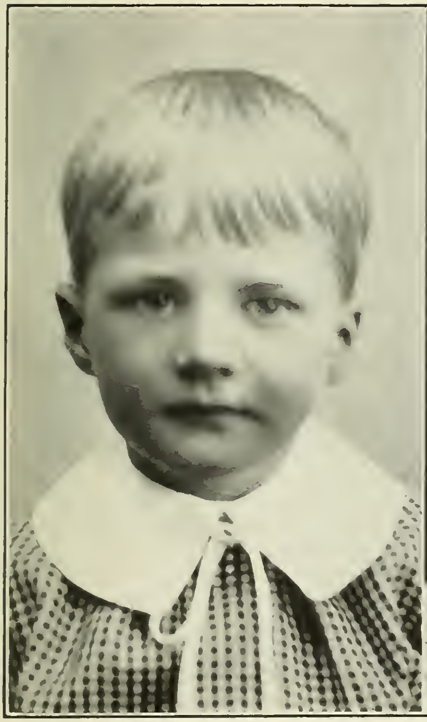
By spreading the temporary teeth early enough in this manner, the crowns of the permanent teeth, which are held by the roots of the temporary teeth, are drawn into the positions which they ought to take. In this way very many irregularities may be prevented which would otherwise be inevitable, and the benefit of proper mastication from good occlusion (proper closing of teeth) will be of great importance.

Previous to 1900 little, if anything, was known as to the influence of the temporary teeth upon the permanent ones, and the most recently published works on orthodontia do not enlighten us on the subject.

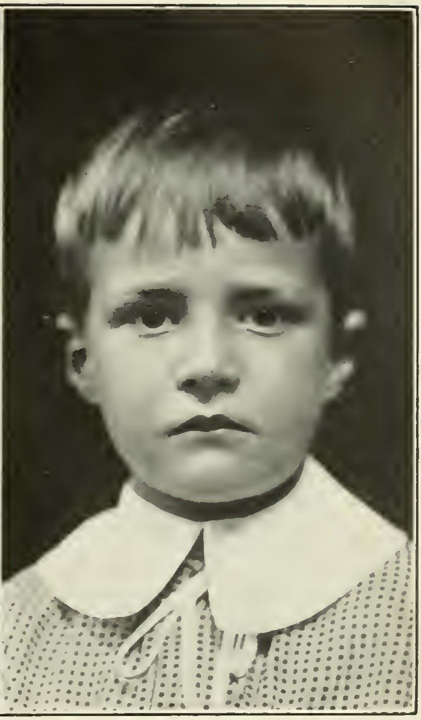
Every mother should ask her family physician to recommend a dental surgeon who is competent to treat temporary teeth; he should carefully examine each child as soon as it reaches its third or fourth year to see if the teeth are healthy and the arches correct.

If they are not, he should be requested to make them so.

There are dentists who are qualified to do this and so prevent a deformity later on.



J. D., 4 YEARS OLD



J. D., 5 YEARS OLD.

W. S. G., 3½ YEARS OLD.

W. S. G., 4½ YEARS OLD

There are others who go so far in the wrong direction as to neglect the temporary teeth, seemingly not realizing that upon their good condition largely depends the position of the permanent teeth and the condition of the surrounding parts, and through them the health and beauty of the teeth, of the face, the efficiency of the breathing apparatus, and so of the whole body.

Some have even advised waiting until the permanent teeth are fully grown before undertaking their correction, thus confirming irregularities and deformities. It is the special function of the orthodontist to correct these defects.

There are two conditions which must call for the attention of an orthodontist at this early age (4 to 6 years), projection of the upper or lower teeth or failure of the temporary teeth to spread apart laterally, especially the six front teeth. At 4 years of age these teeth can generally be spread apart in from 15 to 90 days at small expenditure of time or money and without pain if the child has been well brought up and has not been frightened. After 5 years of age one can never be sure of results under two years, although the actual movement may have been made in two months. The teeth can be drawn into position after the patient has reached adult life, but they will never be very firm and the adjacent parts will never well adapt themselves to the new conditions if the period of growth is passed.

The longer one waits, the greater the expenditure of time, money, and possibly of pain, and the greater uncertainty of the teeth remaining in the positions into which they have been brought.

At 5 years of age, sometimes later, it is still possible to spread the crowns of the permanent teeth by spreading the temporary ones rapidly, but when the temporary teeth begin to fall out there is nothing to attach rapid spreading fixtures to but the permanent molars; besides, if the temporary front teeth are still in the mouth at 6½ or 7 years of age, that is an evidence that an arrest in the normal development has taken place, and it is generally best to resort to the ordinary methods of orthodontia.

Dr. Fred J. Mayer, of Louisiana: I am a delegate from the town of Opelousa, an Indian name, which, when the history of this movement is written, will bear the same relation to popular hygienic education that Chautauqua does to general education. Permit me to accentuate the statement of Dr. Ebersole, at least in so far as the Gulf States are concerned, that the percentage of dental caries far exceeds that of tubercular infection, and is doubtless the most prevalent disease known to civilization. The doctor, in reciting the infractions of oral sanitary law, referred to kissing, but seemed anxious to avoid going deeply into the subject, perhaps because it never fails to excite the risibles of a lay audience, and yet it is difficult to conceive of a more senseless and dangerous practice, or "a custom more honor'd in the breach than in the observance."

Since the human mouth, from the bacteriologic point of view, is the filthiest and most dangerous cavity of the human body, as sanitarians we must condemn the custom, or at least commend the method of the French, who kiss on the cheeks or forehead, and why not of the South Sea Islanders who rub noses, as being less dangerous than the osculatory juncture of two protozoological gardens of microbian horrors.

Where streptococci grin in glee,
  Where microbes dig their holes,
Where germs feel free to split in three
  And exult in their septic souls;
Where still small sobs of spores endure,
  Where blue bacilli bore,
Where of cultures pure
A Washington sewer
  Could not provide any more.

The dental surgeon is to be congratulated on the fact that, like his medical confrère, he has awakened to a sense that his highest function is prevention and not cure.

What a thorny and dangerous path is painfully trod by the human race in its passage from the cradle to the grave! Made doubly dangerous by utter disregard of oral hygiene, the infant is scarcely an hour old when the consumptive mother, ignorant of the danger, kisses it; a little later the father, with alcohol and tobacco tainted breath, opes the portals of the charnel house and contributes his daily quota to the sum of its infection; the bachelor uncle, with lips barbed with the spirocheta pallida, fires his deadly shaft, and one by one the slobbering household and sympathetic neighborhood, innocently but none the less dangerously, implant the deadly product of dental caries, not to speak of specific infections, on the helpless infant, and not an arm raised in its defense; a little later, a consumptive wet nurse, or perhaps the innocent victim of syphilitic infection, administers the daily dose of milk, perhaps from a tuberculous cow, sipping the deadly draught through polluted lips, or cooling it with her fetid breath before administering. Is it a wonder that 50 per cent die in the first year of infancy? Then a little later, if the victim survives the ordeal, the poor waif of ignorance oscillates between mouth-infected pencils, "swapped" chewing gum, school dippers, and universal drinking cups, and even at the sacred altar is forced by custom to drink from the universal communion cup. The survivor, perhaps budding into a glorious womanhood, is then inducted into the mysteries of "Love's young dream," where the open sesame is the polluted kiss laden to the gunnel with microbian infection too often of a specific character; of a verity, if it were not for the wonderful phagocytic resistance of the human organism to both hygienic invasion the whole race would perish from off the face of the earth before the age of discretion.

So let us bend every energy to the advancement of oral hygiene, and place upon our municipal, county, and State health boards a dental surgeon and sanitarian, and carry into the schools and to every hearthstone in the land that knowledge which, at least, will arm them to minimize the dangers.

FRIDAY MORNING, SEPTEMBER 27, 1912.

THE EDUCATION OF PARTLY PARALYZED MUSCLES.

Earl Barnes, Philadelphia, Pa.

The conclusions of this paper are based mainly upon eight years' experience with a little girl who when 18 months old was stricken with infantile paralysis. During these years I have consulted the best specialists in America and England in the fields of general neurology, massage, electrical treatment, mechanical appliances, and corrective exercises. I have also seen many other cases of infantile paralysis and have watched the development of some of them under different forms of treatment or neglect.

The paralysis to be considered in this paper is due to the destruction or impairment of some of the nerve cells in the anterior horns of the spinal cord. These cells under normal conditions send out the motor impulses which cause the muscles in different parts of the body to contract, producing action. Infantile paralysis directly affects neither the muscles nor the nerves. It simply demoralizes or destroys the battery lying behind them. Unlike rheumatism, it leaves the motor apparatus unimpaired, except in the nerve centers where the motor impulse originates. Since its victims are generally children, whose growth is still to be accomplished, the treatment following the acute period of disease, which rarely continues more than a week or two, is mainly educational, and belongs rather to the educational expert than to the physician.

In the case in which I have been specially interested, the child, a girl of 18 months, strong and healthy and walking freely, was so badly paralyzed that at first she was entirely helpless. She had even to learn once more how to creep, and only after some months was she able to stand supported by braces on both legs. From the first, however, there was steady improvement, and now after eight years she is taller and heavier than the average girl of her age and the trouble is confined almost entirely to the left leg below the knee. She walks miles without braces of any kind, swims, and rides a bicycle or a horse. In fact, she does anything which any active girl of 10 years would ordinarily do. The muscles drawing the left foot and toes downward are active, but the muscles that lift the left foot and toes have not recovered activity.

In this recovery mechanical appliances, braces, and supports have been freely used under the best orthopedic direction to be found in

America and England. Such supports, whether of rubber, leather, or metal, have two values. By supporting the weak muscles they enable the child to stand and move about, thus adding greatly to its health and happiness. They also insure the weaker muscles and tendons against overstrain, and thus prevent deformities which it would be very difficult to correct in muscles where control and nutrition were already weakened.

On the other hand, mechanical appliances always interfere in some degree with circulation, and thus increase the probabilities of atrophy. They also make it possible, through the new leverages they establish, for the child to act without calling all the muscles into use. If a foot can be put where one wants it, without using the muscles of the foot, even the partial work they might do is left undone, and, with disuse, power is not recovered, and even what exists may be lost. In the education of impaired muscular control mechanical appliances are often indispensable, but they are at best a necessary evil.

In the treatment of these cases frequent and sustained massage is always necessary. In the case under consideration impaired muscles were massaged every two hours of waking time during the first year, and daily since, with brief exceptions during holidays or travel. The massage, by exercising the tissues, increases the blood supply and works out the broken down matter. By strengthening the blood supply and aiding nutrition it prevents atrophy and all the consequent disorders that accompany the shortening of any members.

However, it must be remembered that the initial difficulty does not lie in the muscles, but in the nerve cells in the anterior horns of the spinal cord. There is doubtless some reaction in these nerve cells through massage, as will be explained later, but the principal values of massage are in keeping up the general health and in keeping the joints free and the bony levers and their muscular attachments in good order, so that if activity of the nerve cells is restored the machinery for action may be ready for use. Massage can also keep unused muscles stretched, and thus prevent deformity.

The effects of electricity on muscular activity are still too uncertain for a layman to pass any judgment upon the matter. I have tried both galvanic and feradic currents, but with uncertain results.

So far we have discussed the means of keeping the muscles in good condition, but how are we to reach the nerve cells in the anterior horns of the spinal cord? Some restoration of function will come steadily with renewed health and the natural processes of growth, but specially devised exercises will certainly accentuate and increase this restoration. This is the point where definite education comes in.

All of Dr. Edward Seguin's work with the feeble-minded rested on the belief that even passive exercises tended to strengthen the nerve centers, and his ideas are now used in the treatment of the feeble-minded everywhere. Thus to make an imbecile think, he exercised the arms and legs and other parts of the body along lines established through coordinated action in the human system by many generations of ancestors for useful purposes. The teaching of Dr. Montessori implies this same belief in the value of organized activity in strengthening nerve centers, though she does not state it so clearly as does Dr. Seguin.

Our present knowledge of the nervous system enables us to understand how action may strengthen the nervous system. An efferent current is sent out to a muscle from a motor center only when that center is aroused by an impulse coming from a sensory center or from an ideational center in the cerebrum. Now, opposite the anterior horns of the spinal cord, are posterior horns of sensory nerves, into which sensations are poured from all parts of the body. These sensory cells of the posterior horns have three connections. They are connected directly with the motor nerve cells in the anterior horns, with the cerebellum, and with the cerebrum.

Let us imagine, then, what must happen if we tickle a child's foot. The sensations will be carried in along an afferent nerve to the sensory nerve cells in the posterior horns of the spinal cord. The impulse will then undergo some change, not well understood, and will pass on as an impulse to the impaired motor cells of the anterior horns, to the cerebellum, and to the cerebrum. If the child be passive, or even asleep, the impulse will pass out of the anterior motor cells to the muscles of the foot, and it will be withdrawn from the tickling finger. If the child is awake and attentive, the outgoing impulse will be strengthened from the cerebrum center, and the foot will be still more vigorously drawn up.

If stimulation and exercise mean growth and health, as we believe they do, then all these centers must be improved if they are normal, or merely impaired. Thus all massage, by exciting a multitude of sensations that flow into the posterior horns and pass into the motor centers in the anterior horns, to the cerebellum, and to the cerebrum, must strengthen all these centers, even if the massage is received in a purely passive state.

But in exercises the child's attention and will can be brought into play, so that the returning body of sensation excited by the action must be vastly more effective than when the child is passive. Further, if these exercises are so planned as to correspond with the habits of the race, which by long repetition have become almost or quite instinctive, our training will be doubly effective, because it will move along lines of least resistance. Walking, talking, handling are types of such actions.

Thus, if the muscles of the legs are affected, we can put the child on a tricycle and tie his feet to the pedals. If he is then pushed about, the thousands of sensations excited in connection with a movement of the legs habitual to the race will pour back to the posterior horns of the spinal cord and pass on to the impaired motor cells of the anterior horns, tending to strengthen them. They will also pass to the cerebellum and the cerebrum, from which they may come back as voluntary effort, still further strengthening the impaired cells. Walking, swimming, and horseback riding will broaden and strengthen the general training of the impaired centers.

But the nerve cells of the motor centers, if not entirely destroyed, undergo different degrees of impairment. Some are capable of very slight response, while others may remain nearly normal. Here the specialist, intimately acquainted with anatomy, must come in to direct special exercises. If the right foot turns outward, exercises must be devised that will make the foot turn in. Understanding the game, but not necessarily the purpose, the child will concentrate his attention and his will upon it. Such effort as he can make he will put forth, and the sensations awakened by the effort will travel back and ultimately produce an effect upon the impaired centers which should control that action.

It is obvious that the cooperation of the patient is of the greatest possible value. Hence the educator must call to his aid every possible device that will interest the child. Approval, praise, rewards, imitation, contest, a sense of steady advance will make the child his own best aid in working through the otherwise dreary repetitions that lie on the road to recovery.

Meantime, with skillful direction and unfailing courage, the restoration of function may go on for years. I have seen constant unremitting effort fail to produce any visible results for a year, and yet eventually lead to almost complete restoration.

TRAINING OF MIDWIVES IN RELATION TO THE PREVENTION OF INFANT MORTALITY.

Miss Clara D. Noyes, New York City.

Before proceeding with the paper which I have been asked to present, I wish to offer an apology to the audience for being here. Miss Carolyn van Blarcom, executive secretary of the committee on prevention of blindness of the New York Association for the Blind, was expected to present this subject, but prolonged illness has prevented her from doing so.

The many cases of preventable blindness directly traceable to the carelessness and ignorance of untaught midwives seemed of such vital importance to unborn babies that this committee widened the purpose for which it was originally formed, and, with the aid of the Russell Sage Foundation, has been making a careful study of the midwife both here and abroad.

Prior to the passage of the act which provided for the control of midwives conditions in England were strongly analogous to those now existing in America. This committee was greatly impressed by the simplicity and practicability of the English law, and by the fact that, instead of replacing obstetrical practice by the work of trained midwives it has increased the work of medical obstetricians.

The midwifery section of the American Association for the Study and Prevention of Infant Mortality, at a meeting held in Chicago in 1911, spent considerable time in the consideration of the midwife and midwifery problem in America. In summing up the findings of this section we note that further study of the midwifery problem was suggested "before recommending any policy as to abolition or the recognition or supervision of the midwife." This apparently negative attitude appeared to leave the matter where it has drifted about in the past. Fifty years ago the Medical Society of New York County voted almost unanimously against licensing the midwife. From time to time since then, and quite generally throughout the United States, attempts have been made toward control and restriction, even abolition, of this class of workers. Laws to this end have been framed and passed, but in no place do they seem to have been effectively or systematically enforced, as the midwife is found plying her trade throughout the length and breadth of the land. Every sickly, ill-nourished infant, every babe brought into milk stations, dispensaries, or hospitals, with infected eyes or preventable deformity, for which a midwife is responsible, adds fresh evidence against our apparent indifference and blindness to existing conditions. Granting that the midwife problem is of too long standing to be settled hurriedly, and warmly advocating the most careful and thoughtful study of the ways and means toward the solution of this problem, nevertheless, it would seem that the most ardent advocate of the abolition of the midwife could hardly bring an accusation of undue haste against those who have been brought to believe that society calls for her continuance and suitable education.

The history of the midwife is the history of the human race. Out from the dim obscurity of countless ages she makes her appearance, officiating at the birth of the mighty. She dared assert herself even against kings. When Pharoah issued the order to the midwives saying, "Every male son that is born ye shall cast into the river." Puah and Shiprah defied him and outwitted him. If they had not, Moses, who, afterwards became the great Hebrew leader, would not have been saved to lead his race to the Promised Land.

It would take too long to trace the history of the midwife down to modern times, when we find her, in America at least, pushed into the background by the medical profession, and with few exceptions belonging to a conspicuously ignorant and untaught class, totally unfit to discharge the duties they are constantly called upon to perform.

Deplorable as this may be, in justice to the midwife, we find from all reports that midwives are responsible for less injury to mothers and children than that laid to the door of the medical profession. Dr. Williams says: "It appears that the majority of teachers in this country consider that general practitioners lose as many, and possibly more, women from puerperal sepsis than do midwives." The same seems to be true regarding preventable blindness and deformities; to quote again from Dr. Williams: "This is a terrible indictment against the medical profession." Yet we find in a recent editorial in the Boston Medical and Surgical Journal the midwife thus described:

> The midwife may be defined as a person attempting to practice obstetrics without complete or even adequate medical education. The tolerance of such persons is an anomaly in an enlightened civilization. The midwife is a relic of medievalism, unhappily, extant in the Old World, but whose persistance in our own community should not be encouraged by any form of recognition.

Nevertheless, even in America they are attending approximately 50 per cent of all births. In New York City alone 50,000 annually. Even in the shadow of the "gilded dome," where the laws of Massachusetts are made forbidding them to practice, they are recognized and birth certificates having their signatures are accepted.

It is true that we have very inadequate statistics from which to form our conclusions, yet we have sufficient to know that failure to recognize the existence of the midwife or to ignore her existence amounts to little short of criminal negligence.

Dr. Baker, of the child hygiene bureau of the New York City Department of Health, reports that out of 33 States from which she has gathered statistics only 13 could show that the practice of midwives is defined by law. Six of these know the number practicing, and only 4 could state the number of births reported by them. No one knows, apparently, how many are practicing. In New York City, in 1911, there were 1,344 permits in force, but district nurses, social workers, and physicians feel confident that probably as many more are practicing without permits.

The Old World has faced the problem with greater honesty and has provided adequate instruction for the midwives with laws for regulation and supervision. Excellent schools, with courses varying in length from six months to two years, exist very generally in these countries, the laws of England and Denmark being particularly fine and conspicuous for the class of women who enter the field. In Denmark midwives practically control the practice of midwifery, and we find a remarkably low infant and maternal death rate.

"The value of trained midwives," to quote from Miss van Blarcom, "is already apparent in England, where 12 years ago conditions were strongly analogous to those in America at the present time. It is believed by English workers that the better obstetrical work being done by English midwives as a result of their better training and better control must be reckoned as one of the important factors in the decreased death rate among infants and mothers, the percentage having dropped from 151 deaths among infants per 1,000 during 1901 to 106 per 1,000 in 1910." A corresponding maternal decrease in deaths from puerperal sepsis and accidents of childbirth is also reported.

Contrast this with the state of affairs existing in America, 50 per cent of our future citizens being attended at birth by a class of workers for whom we have provided no special opportunity for education. In the face of a social condition which is bound to sustain the midwife, can we at present, or for many years to come, abolish them, even if found possible under the American Constitution? Assuming that we can not abolish them, then we must, in all honesty, recognize them, provide for their education, their regulation, and subsequent supervision.

The question has been and will be raised as to the wisdom of providing for the education of a third class of workers when physicians and nurses are already in the field. It must be remembered that midwives also are already in the field, and, for economic reasons, seem destined—at least for the present—to remain. Therefore under the circumstances education seems only logical.

Better-trained physicians, extension of free obstetrical clinics and obstetrical hospitals, education of the laity, and further development of visiting obstetrical nurses are some of the recommended substitutes. It would take years to accomplish these reforms. Even, then, will they replace the midwife? If not the midwife, who? Will highly trained obstetricians practice on the East Side of New York or in the rural districts? Will the foreign-born woman, with all the inherited prejudices of generations against the "man-midwife" and a family of children clinging to her skirts, enter in any numbers the obstetrical hospital or take advantage of the free obstetrical clinic? Even if she were willing, her husband would probably rise up and prevent her from doing so. Education, excellent as it may be, is discouraging, for every ship brings hundreds who possess the same traditions and prejudices against hospitals and the man-midwife, while conditions remain the same in the rural districts, where the mothers and babies of the poorer classes are subject to unparalleled neglect and suffering. Desirable as hospital care may appear to be for the poorer classes, from such statistics as I have been able to collect we find, even in a great city like New York, with its millions of inhabitants, approximately 1,000 beds for obstetrical patients, and although at times these are filled, there are many times when these beds are not filled. There seems to be little pressure, generally speaking, for more obstetrical beds. Every teacher of obstetrics, both physicians and nurses, will acknowledge, I am sure, the uphill work encountered in establishing an active obstetrical service for medical students and pupil nurses in general hospitals. Out-patient services seem to be upon the whole more popular with the poorer classes.

The midwife may be gradually replaced by the combined force of these substitutes, but in the meantime here she is, and has been for ages, and here she apparently expects to remain.

It is important that the difference between a midwife and obstetrician should be clearly understood by all. A midwife should never officiate at other than absolutely normal cases, but in order to be able to distinguish between normal and abnormal she must of course have careful practical teaching. Neither would we wish to appear to be underrating the value of obstetrical hospitals, free clinics, and district obstetrical work in the community. They are of inestimable value, not only to the public, but they play an important part in the general educational scheme of physicians and nurses.

If we would guard at the foundation the strength of the nation we will no longer ignore the existence of the midwife and the part she plays in the social structure. All leading authorities in the question of infant mortality agree that the prenatal care of mothers, instruction to mothers in infant and personal hygiene, adequate obstetrical care and breast feeding, are all essential factors toward a lowered death rate among infants. With characteristic waste of our natural resources, approximately one-half of our child life is under control before, during, and after birth by a class of workers who have not been taught themselves, and who are therefore not prepared to give this fundamental teaching.

We must not condemn the midwife too harshly for her lack of training, for we again and again find her, without compulsion, making an effort to secure teaching and availing herself of such opportunities as present themselves, only to find that, after spending money and time, she has been exploited, and the few lectures she has heard and the pretentious diploma which she has received are of little practical value. In a country without standards, with inadequate or no laws for regulation and supervision it would be preposterous to expect the midwife to be other than she is. Even the well-trained foreign midwife, as the stimulus of supervision is removed, lapses and becomes careless.

The arguments which have so far been advanced against the training of midwives do not seem to those who believe in her education to be particularly sound ones. One eminent authority says in speaking of a lowered maternal death rate: "It is not by educating the midwife to do better work, because we have seen that the mortality in the midwife's practice is not as great as in that in the hands of the medical practitioner." We can not feel that this criticism of the work of the physician is any reason why we should discontinue the struggle for better medical education. If the midwife does better work untrained than the general practitioner, what type of work would she do after six months or one year of careful training?

It is also contended that the type of woman who would apply as candidates for training would be of such a low order that it would be a waste of effort, since, when trained, they would gradually slip back into careless or ignorant ways. That would be almost certain to occur unless laws were made for control and careful supervision, such as we find in England, under the central midwives' board. Education means elevation and progress. It has not been a very long time since doctors were barbers and not long since the nursing care of the sick was rescued from degradation by Florence Nightingale. A very high type of woman enters the field of midwifery in England. Many nurses superimpose this course upon their general training and, under the direction of visiting nurse associations and charitable organizations, work among the less highly favored classes in the large cities and through the country districts as Queen's nurses. It has also been proven beyond question that trained midwives, instead of invading the province of physicians, as some members of the profession have feared, the activity of trained midwives has actually resulted in greater demands upon the services of medical obstetricians. The more highly trained and educated the midwife, the less willing will she be to assume responsibilities which are not hers, the more quickly will she recognize them and the greater discrimination will she show in the type of physician she calls to her assistance. There seems to be no fundamental reason why the technically educated midwife should be feared any more than the technically educated physician or nurse. Any institution or profession, whether the law, medicine, or nursing, acknowledges an inherent weakness when present position or temporary success is considered before the great human cause lying in the background. It is not unreasonable to expect that advanced obstetrical training will eventually be given to nurses in this country to fit them to carry their share in this problem of mothers and babies. A prophetic note was struck at the Chicago meeting last year by the section on nursing and social work, when a resolution to this effect was offered, but was finally held over for further discussion.

If the midwife can be gradually replaced by the nurse who has superimposed upon her general training a course in practical midwifery which has been clearly defined by obstetricians, it would seem a logical economic solution of the problem, for we should not only save the expense of training another class of workers, but we should be able to provide better teachers, better nursing, and eventually better medical assistance to the less highly favored classes.

The practical difficulties to be met in providing education for midwives are not inconsiderable. The requisites are material and money. Our State and National Governments provide for the education of every known class from the feeble-minded to those desiring a scientific education. Why not for midwives? The school for midwives which was organized at Bellevue Hospital in July, 1911, is supported by the city of New York. It is the first of its kind in America and has demonstrated that midwives can be taught, and, moreover, that so far they have proved acceptable to the community.

Dr. John W. Brannan, president of the board of trustees, inspired by the investigations that were being made by the committee on prevention of blindness, quickly advocated the training of midwives, and this little school, important as the entering wedge, was the immediate result.

In little more than a year the beds in this hospital have been increased from 8 to 20 and the work in the out-patient field steadily growing, while the individual experience shows that where the first midwife, finishing a six months' course, observed 60 cases and delivered 8, the last one finishing observed 104 and delivered 12. In this school particular emphasis is placed upon the prenatal care of the mother and her surroundings, the nursing care of mother and baby, and the importance of breast feeding. The pupil midwives are required to do all the housework, thus acquiring a fundamental training in cleanliness, cooking, sanitation, and hygiene.

Dr. Jacobi in his masterly address to the American Medical Association in June, 1912, placed the stamp of his approval upon this venture and advocated in no uncertain terms the wisdom of providing suitable education for the midwife.

Admirable as any provision for education may be, it will be a loss of effort without regulation and systematic supervision.

Education and legislation will surely mean the gradual elimination of the old familiar type of midwife. I venture to prophesy, although I may be wrong, that it will not be long before we see our cities and larger towns districted and covered by trained and certified midwives working under the visiting nurse or charitable organizations, with the same organization extending into the rural and mining districts. In the rural districts of the South I see a distinct place for the certificated colored nurse, who now has considerable difficulty in securing nursing work. This work may even be under State or National control. Would it not be a wise economy and therefore a national asset as long as babies must be born and will be born that they are born as healthy as possible? I would not have you misunderstand me. Even the most optimistic would not expect, by the simple process of training midwives, to secure perfectly sound and healthy babies, but investigation has shown that she is an important instrument and that we can no longer tolerate existing conditions. Our spirit of citizenship is at last stirred, the pitiful cry of the neglected infant has at last touched our hearts, and it is for this reason that we urge the education of women, whether as the midwife pure and simple, or as a further development of the nurses' work in the practice of normal midwifery, not as a means of livelihood, "although every laborer (even a midwife) is worthy of his hire," but fundamentally as a protection to the strength and health and wealth of the Nation.

PHASES IN THE DEVELOPMENT OF THE INFANT WELFARE MOVEMENT IN ENGLAND.

Dr. JANET LANE-CLAYPON, King's College for Women, University of London, England.

Thirty years ago the movement to prevent infant mortality was commenced in France; the greatest developments belong, however, to a much more recent date and are in Europe, at any rate for the most part, products of the last decade. Those of us who have been privileged not only to take part in the movement but also to have the opportunity of personally following the phases of development in the various countries have seen gradually unfolding before us what, I think, may fitly be described as a vast scientific experiment.

The object of this research was the means of prevention of the death of infants. The research is not yet completed, but the data so far available are such as to justify a review of the results obtained at the present time and of the work which is still in progress.

During the last few years, in which I have had the opportunity of studying the methods used in those countries of the Continent of Europe which are most actively engaged in this work, it has seemed to me that we in England have provided a peculiarly fitting ground for the gaining of experience in this work of infant welfare. We have unwittingly supplied the control cases for the great experiment, as far as it at present stands.

I need hardly mention that the real beginning of the movement was made by the establishment of the first infant consultation (consultation des nourissons) by Prof. Budin; this consultation had no milk depot attached, but sterilized milk was supplied to the few cases where breast feeding was found to be impossible. This led, however, to the founding of the "goutte de lait," or, as we know it, the milk depot. These institutions caught the public attention and spread with great rapidity even into remote parts. I should like, however, to emphasize the fact that initially there was no such institution as a milk depot alone, but an infant consultation, presided over by a physician, was always carried on in connection with the depot, to which infants receiving the depot milk were required to be brought at stated intervals.

England, alone, of all the European countries, has seen the establishment of milk depots without any medical supervision of the infants receiving the depot milk. I should mention that in a few cases the medical officer of health gave some degree of supervision to the infants.

In England we have, therefore, been the means of demonstrating the advantages and disadvantages, respectively, of the two institutions originally found together in the "goutte de lait," namely, the infant consultation and the milk depot.

As a whole, it may be said that the star of the milk depot never rose far above the horizon in England, and is now waning. All the milk depots have been municipal undertakings, the expense being borne by the towns, except that at Finsbury, which was started as a voluntary effort, and York had a depot for about two years which was also supported by voluntary contributions. Out of the 11 depots started in England, 2 have been closed, 1 (Leicester) is no longer a milk depot in the usual meaning of the term, and several others have been on the point of closing down for some years past. The causes for this are many and varied, but there are certain predominating points, which are common to all the towns. In the first place, the expense involved is very heavy, varying roughly from just under to just over £1 ($5) per head per child on the books. This expense is incurred on behalf of a comparatively small number of infants, since it touches, in the first place, only the artificially fed infants, and further, only a relatively small percentage of these. The number of breast-fed infants is, generally speaking, fairly high in England; the available data are scanty, but it appears to vary considerably in the different localities, depending upon the occupation of the mothers.

In St. Helens, where the first milk depot was started, a record has been kept for several years, and it appears that in 1910, 98 per cent of all the infants born were breast fed, and only 6.6 per cent were weaned under 6 months of age. The figure for this town seems to remain at about this level. In Finsbury, which was the first borough to close down its milk depot, in 1909, 90 per cent of the infants were breast fed up to 3 months of age, either entirely or partly, and a very considerable number were so fed for longer periods. The remaining number of infants available for the milk depot was therefore comparatively small.

In almost all the towns it was found that the death rate among the infants receiving the depot milk was greatly less than in the town as a whole. This could not, however, be altogether attributed to the influence of the depot milk. In an uncontrolled milk depot there is great risk of encouraging artificial feeding, owing to the saving of trouble to the mother in obtaining the milk already prepared for the infant. How far this occurred in England is not known, there being no data, but those who have had any experience of infant consultation work know how often a mother is convinced that her milk is insufficient, and it requires the evidence of the baby's weight curve, a test feed, and medical authority to persuade her to the contrary. Such cases would naturally resort to a milk depot in the absence of a consultation.

In this connection I should like to quote to you a sentence which occurs in this year's report of the Association for the Prevention of Infant Mortality of the Düsseldorf division of the Rhine Province. This association is admittedly the most advanced in Germany, and its experience can therefore be accepted. The sentence is, " In spite of all precautionary measures, in places where milk kitchens are in operation, there is a fall in the percentage of breast-fed babies; this is beyond question a fact, and has been shown by special statistics, and has been further especially proved in our own division."

Further, the depot milk not infrequently fails at the crucial moment, namely, in the hot summers, and the same Düsseldorf report touches upon the unfavorable results which have sometimes been obtained with depot milk during the summer quarter, presumably owing to the souring of the milk.

In England, whilst it was becoming apparent that milk depots were very expensive institutions, and that the clientele did not appreciably increase, attention became directed along other lines.

The preliminary movement started by Dr. Moore, of Huddersfield, in connection with the notification of births in that town, led ultimately to the Notification of Births Act of 1907.[1] This act rendered the birth of any child notifiable within 36 hours after birth, on pain of the infliction of a fine for failure to make such notification. The act may be adopted by any town or district, but is not compulsory. In adopting the act, it is required by the local government board that it be shown that arrangements have been made for the visiting of the infants, whose births are notified by trained women. The beneficial effects of this act have been, and continue to be, far-reaching. It has led to a vast and always increasing amount of effort on the part of the municipalities in the prevention of infantile mortality. It will perhaps simplify matters if this aspect be dealt with first of all, before considering the vast and likewise increasing amount of work which is being carried on by voluntary effort.

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[1] This notification is distinct from registration. Registration has been compulsory for many years, and must take place within six weeks after birth.

Many of the large towns at once adopted the Natification of Births Act, and began to make provision for the working of it. Birmingham may fitly be taken as a good example of the type of work which is being carried on in this connection, and of the results obtained. Almost identical methods, however, are followed in Manchester, Glasgow, and many other towns of smaller size, but those of Birmingham have been thoroughly analyzed, and are therefore readily applicable.

The Notification of Births Act was adopted in 1908, and a woman doctor, Dr. Jessie Duncan, and two health visitors were appointed to carry on the work of visiting the notified births, their efforts being concentrated upon the worst quarter of the city, namely, the wards of St. George and of St. Stephen.

The infants are visited soon after notification, and are kept under supervision, being brought up to the consultations held by Dr. Duncan, and regularly visited by the health visitors, cases of sick children being also visited by Dr. Duncan. The results of this system of supervision were almost at once apparent, but the crucial test was put to them last year in the shape of one of the hottest and most prolonged summers which had been recorded either in England or on the Continent for many years. Before 1911, the mortality for Birmingham, as a whole, had fallen gradualy from 132, in 1907, to 114, in 1910. In 1911 it rose to 150. In the wards (St. Stephen's and St. George's) where the organized visiting was being carried on, the mortality among infants in 1910 was 20 per cent and 12 per cent, respectively, below the average for the preceding five years; in 1911, although the mortality in these wards was considerably higher, in St. Stephen's ward it was still 1 per cent lower than the average for the preceding five years, and in St. George's it was 22 per cent. In other wards of the town, however, it was from 36 to 46 per cent higher than for the average five preceding years. The mortality results were highly satisfactory. Mortality is not the only criterion of the results obtained. The general health of the children, their cleanliness and tidiness, and that of their mothers, is reported to have greatly improved as a result of the consultations. The active encouragement of breast feeding, and of partial breast feeding among mothers who were obliged to work, has resulted in 71 per cent of the employed mothers being able to partly breast feed their infants, whilst among the non-working mothers the percentage of breast feeding has risen from 75.1 to 79.1 per cent.

The condition of the children as to health has been studied and classified, the results being arranged in three headings: Good health, fair condition, and poor health. Dr. Duncan's report shows that there has been an increase of 4 per cent (from 59 to 63 per cent) in the children in good health, with a corresponding decrease of those in poor health; those in fair condition remaining stationary at 27 per cent, these figures being for the years 1909 and 1910.

This means a very substantial improvement in the general health of the children in these wards, and the Medical Officer of Health hopes to extend the work to other wards.

A fair number of the largest towns have now appointed women doctors, in some cases as assistants to the Medical Officer of Health, to supervise the work of the health visitors on lines similar to, if not identical with, those just described for Birmingham. The general feeling is that this method of dealing with the health of the infant population is extremely satisfactory. Before passing on to the work which is being carried out by voluntary agencies I should like to mention the case of Glasgow. A milk depot was established in this city in 1904, and later, in connection with the adoption of the notification of births act, Dr. Florence Mann was appointed as assistant Medical Officer of Health. She conducts consultations and supervises the health visitors, as already described. In 1909 it was found that there were a considerable number of children who were attending the consultation who were receiving depot milk, and a comparison was instituted as to the rate of growth and general well-being of these children who were under medical supervision, but of whom some were receiving town milk, under the direction of the doctor, and the others were receiving the costly depot milk. It was found that no appreciable difference could be detected between these groups of children. As a result of this investigation the milk depot was closed on the advice of D. Chalmers, the Medical Officer of Health for Glasgow. I hope it will not be supposed that, in this remark, I am underrating the value of pure milk. This is not the case, and I think there are some special cases where a milk depot may be a real benefit, but, where the mixtures are fixed, as they invariably are with us, the need for the depot would appear to be so limited as not to justify the expenditure of so much money.

The large mass of work which is being carried out by voluntary agencies must now be considered. I believe that the earliest effort in this direction was the founding of the Westminster Health Society, in 1903; this society consisted of a committee of persons interested in social matters, who visited in the district and did many kinds of work. As regards infants, with whom we are more particularly concerned, arrangements were entered into with the large voluntary hospitals in the neighborhood to notify the society of cases of expectant mothers who were to be attended in their confinements by doctors from the hospital, and these were visited by the visitors of the society. Other health societies have gradually grown up since this date and there are now a large number of these bodies in the kingdom. The St. Marylebone Health Society, which was started in 1905, was the first society to have an infant consultation attached to it. This was started in 1906, on the initiation of Dr. Eric Pritchard, and was the first infant consultation to be started in this country apart from the very general supervision which had been exercised in some few cases by the Medical Officer of Health over the children having the depot milk. The great success of this consultation speedily led to the establishment of others, and there is no doubt that the infant consultation movement has come to stay, since there are now some 200 or more in the kingdom and the number is rapidly increasing. In general, and this is increasingly the case, the consultation is held in connection with a Health Society, the society undertaking the visitation of the cases attending the consultation. The health visitors, who are sometimes salaried and sometimes voluntary, attend at the consultations, hear the directions given, and subsequently see that these directions are carried out in the homes. In most places the Health Society endeavors to work in cooperation with the Local Municipal Authority, and, in very many cases, with profit to both parties. In St. Marylebone, where the relations between the municipal and the voluntary workers are of the most friendly type, all the babies whose births are notified are visited at intervals, either by the salaried municipal health visitors or by the voluntary visitors of the health society. The difficult cases are referred to the consultations, of which there are two held in different centers on several days of the week; there are too many children for the ideal plan to be followed, namely, that all the children should be under medical supervision. About 500 cases are referred to the consultations every year.

A few difficulties have occurred in connection with the infant consultation movement, which are, however, in process of solution.

The first difficulty is the Medical Officer of the consultation. Many people still consider that a trained nurse is quite competent to hold the consultation. This we are energetically combating. The Association of Infant Consultations and Schools for Mothers has laid it down that no society shall be considered as holding a consultation unless every child under the age of 6 months who is brought to the consultation is seen at least once a month by the presiding medical officer.

The next point is the difficulty of getting a medical officer, since the work is unpaid, and not every medical man or woman is suited for the work. Budin's saying that an infant consultation is worth exactly as much as the presiding doctor is still most true.

We in England have not yet grasped the importance of every medical man or woman having at least some knowledge of the feeding and the minor ailments of babies, and we sadly lack any means of training medical students in these most important matters. Feeding cards of the most antiquated and, to our modern knowledge, terribly fallacious type are still handed out from institutions which should be centres of enlightenment.

Then the question of health visitors also presents some difficulties. They should be trained and be salaried. Satisfactory voluntary health visitors are the exception, but the society often finds it impossible to provide the necessary funds for a salaried health visitor. Before concluding my remarks about infant consultation I must mention the work of the schools for mothers. The first of these was started in St. Pancras, London, some five years ago, and an infant consultation was connected with it. The mothers are taught to cook, sew, and mend, and to wash the babies, etc. Dinners are also provided for expectant or nursing mothers. A large number of these schools are now in existence, with infant consultations attached, and the number of these is also rapidly increasing.

The combined infant consultation and schools for mothers movement is undoubtedly a most valuable agency for the improvement of the health and the reduction of the mortality among infants and young children. The results obtained are most satisfactory, and the immensely educative influence of the whole system is, to my mind, one of its most promising features.

Before closing I want to say a few words about the feeding of the consultation babies. The aim of the consultation is to promote breast feeding, and the number of artificially fed babies is relatively small. For these milk is not provided. They are, if possible, referred to a reliable dairy in the neighborhood, but, as a rule, no extra precaution is taken, and the prevailing, if not universal, custom is to boil the milk before using. During the last three or four years there has been a development in favor of giving dried milk to babies; that is, it is sold at the consultation to the mothers.

A great point is made at all the consultations, whether municipal or not, of not giving any financial assistance. If cases are really shown to be necessitous, assistance is obtained for them from some local charity, but it is made clear to the recipient that it does not come from the consultation.

Dried milk is now used on a large scale at Sheffield, Leicester, and St. Marylebone. Glaxo was used at Finsbury before the closing of the milk depot and the results obtained were entirely satisfactory. At Sheffield Glaxo is also used for the babies who are under the supervision of the medical officer appointed by the municipality. At St. Marylebone we now use Trumilk very largely, with excellent results. The case of Leicester is of sufficient interest to warrant further comment. The Leicester milk depot was started in 1906, with modified cow's milk sold in bottles in the usual way. In 1907 there was an average of 202 children on the books, and the cost to the rates was £339 5s. 3d. ($1,500 to $1,600).

Toward the end of 1907 the medical officer of health, who personally conducted a consultation at the depot, commenced the use of dried milk. The expenses at once began to decrease and the number of babies to increase, so that in 1911 the average number of babies on the books had risen to 325, and there was an actual gain to the rates of £41 3s. 7d., £1,060 6s. 7d. having been spent in the purchase of dried milk, no modified milk having been used at all.

The dried-milk phase has started well, and the consensus of opinion is greatly in its favor. The fear of producing rickets or scurvy is gradually dying out in face of strong evidence to the contrary, although in view of the fact that dried milk is sterilized milk some doctors recommend, especially for weakly babies, the additional administration of a little fruit juice.

Perhaps the ideal method of milk supply to consultation babies is that adopted by the municipality of Berlin. Here raw milk, kept cool, and of the quality of American "inspected milk," is supplied at market price to all the artificially fed infants attending the municipal consultations. About 30,000 attend these consultations every year, of whom only a small percentage are, however, artificially fed. The consultations are held at seven centers by children's specialists, who attend every day of the week, with three or four assistant medical officers and a staff of health visitors. The milk is boiled and prepared by the mother in the home, under the direction of the health visitors, the modification being prescribed by the medical officer of the consultation.

Such is the brief outline of the infant-welfare movement in Great Britain.

At present there is some degree of separation between voluntary and municipal work, but I believe the time to be not far distant when the voluntary work will be taken over by the municipality; that is to say, it will be recognized that the health of the child population is of such importance as to justify the expenditure upon it of the money of the community among which the children reside.

We have had to learn our lessons by bitter experience, with little or no support from the mass of the community, but, looking back over the past five or six years, I think that the progress has exceeded even the most sanguine forecast which could have then been made.

MUNICIPAL SUPERVISION OF MATERNITY.

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In at least 10 large cities of the United States there have been active and concerted efforts in the past two years to reduce an evident and unnecessary mortality among infants. While the greater part of the work has been done by private organizations, in most cities the health authorities have cooperated. Three cities have bureaus of child hygiene, with well-organized systems devoted to this special public-health problem. With campaigns of education through visiting nurses, physicians, and exhibits, and by assuring supplies of pure clean milk, successful results have been attained in some of these cities. Those health officers who have been active in planning such work now realize that there is a limit to the results that can be obtained. With a close study of cause and effect as seen through vital statistics diseases of infants were divided into the preventable, partly preventable, and nonpreventable. The preventable included diseases of the gastrointestinal tract, the respiratory diseases, pneumonia and tuberculosis, and the communicable diseases. In several cities public-health movements reduced the mortality from these diseases.

There remained uninfluenced and stationary a class of diseases classified as partly preventable. These were the diseases of early infancy, congenital debility, premature births, injuries at birth, and so-termed stillbirths. Vital statistics, the index to our efforts, have been sadly lacking, and the important rôle that these diseases played in infant mortality has been underestimated. Statisticians have heretofore tabulated deaths by yearly periods, requiring the United States Government, in their census on mortality previous to 1910, to omit a most important tabulation—the deaths in monthly periods in the first year and the daily periods in the first week. This new classification admits of a study which explains the reason for the limit in reducing infant mortality by the present health movements in our cities.

Deaths for the registration area of the United States for the year 1910, by days, weeks, and months.

Cause of death.	Under 1 day.	1 day.	2 days.	3 days.	4 days.	5 days.	6 days.	Under 1 week.
All causes	14,946	7,505	4,453	3,359	2,400	2,031	1,657	36,351

Cause of death.	Under 1 week.	Under 1 month.	First month.	Second month.	Third month.	Fourth month.	Fifth month.	Sixth month.	Under 1 year.
All causes	36,351	58,089	15,223	12,923	11,358	9,828	8,618	8,198	154,373
Diarrhea and enteritis	684	4,477	4,692	4,980	5,080	4,672	4,129	3,797	44,695
Communicable diseases	67	713	837	643	590	590	530	620	6,621
Tuberculosis	32	127	152	175	211	212	228	254	2,416
Pneumonia	712	3,157	2,010	1,852	1,596	1,517	1,343	1,469	19,036
Syphilis	228	608	369	247	136	89	58	48	1,658
Convulsions	1,144	2,070	434	319	244	197	177	165	4,089
Malformations	4,380	5,901	502	297	176	149	110	88	7,501
Premature births	16,197	19,498	582	195	....	....	....	....	20,275
Congenital debility	5,943	10,273	2,863	2,118	40	12	11	12	15,371
Injuries at birth	3,430	3,689	28	8	....	....	....	....	3,725

Classification of all deaths under 1 year in respect to preventability by means of present health movements.

Total deaths under 1 year	154,373
Class I. Preventable and partly influenced by present health work:	
Diarrhea and enteritis	44,695
Diseases of stomach	2,874
Pneumonia	19,036
Tuberculosis	2,400
Contagious diseases	6,621
Total	75,626
Class II. Preventable and not influenced by present health work:	
Premature births	20,275
Congenital debility	15,371
Injuries at birth	3,725
Malformations	7,501
Convulsions	4,089
Syphilis	1,658
Total	53,019
Class III. Partly preventable: All other diseases	25,727

In United States (registration area, 1910):	
Deaths under 1 year, all causes (19.2 per cent of total)	154,373
Deaths in the first month (37.6 per cent of deaths in first year)	58,089
Deaths in first week	36,351
Premature births, congenital debility, injuries at birth, malformations, and convulsions (almost one-third of all deaths under 1 year)	50,960
Above deaths in first month (80 per cent)	41,431

In State of Pennsylvania:	
Deaths under 1 year (24 per cent of total deaths, all ages)	28, 377
Deaths under 1 month (33 per cent of deaths under 1 year)	9, 548
Congenital affections (31 per cent of deaths under 1 year)	8, 862
In Philadelphia (1911):	
Deaths under 1 year (17.6 per cent of total mortality)	4, 636
Preventable diseases	2, 068
Diseases of early infancy	1, 480
Nonpreventable	1, 015
In Germany (Prof. v. Franque, of Giessen):	
Deaths before birth	63, 000
Deaths in first 15 days	80, 000
In England and Wales (1909):	
Under 1 month, per cent of deaths under 1 year	36. 5
Under 1 week, per cent of deaths under 1 year	22. 7
Wasting diseases, per cent of deaths under 1 year	38. 3

The early deaths include (1) abortions and miscarriages; (2) deaths during labor, including (*a*) accidents and injuries during labor, and (*b*) stillbirths; (3) deaths during the first week of life from (*a*) premature births, (*b*) congenital debility, (*c*) forces acting during intrauterine life, syphilis, malformations, convulsions, and (*d*) injuries at birth; (4) deaths during the first month of life.

In the registration area of the United States, in 1910, 37.6 per cent of the deaths in the first year of life occur in the first month and almost two-thirds of these deaths occur in the first week. One-third of all deaths under 1 year are due to premature births, congenital debility, injuries at birth, malformations, and convulsions, and 80 per cent of these deaths occur in the first month; 36,351 deaths in the first week, and almost one-half of these occur in the first day. It is evident that improper food or feeding, with resulting gastroenteric trouble, is a negative factor in these deaths. The lives of most all of these infants were uninfluenced by conditions arising after birth. This mortality must be assigned to prenatal conditions and conditions arising at birth.

Except a very small amount of prenatal work performed in four cities of the United States, there is little of our public-health work that can influence the early infant deaths. A close study and analysis of the causes and number of deaths in the first month and first week of life give sufficient evidence that there should exist certain municipal supervision over the period of pregnancy, and during labor and the first month of life.

My excuse for presenting this contribution to this congress is to offer some suggestions as to possible methods of control of the early deaths.

While vital statistics do not include abortions, miscarriages, and stillbirths, it seems but fair, in a consideration of early deaths, to include the possible infant.

It is impossible to estimate the number of abortions and miscarriages, but it has been variously estimated at about 10 per cent of the pregnancies. Social duties, financial conditions, work, nationality, and intelligence are some factors influencing the number of these deaths. Abortions and miscarriages are more frequent among the native-born Americans than among foreigners, due possibly to greater social aspirations of the native-born American. Intelligence increases the desire for fewer pregnancies and small families. More full-term pregnancies are found among the poor, due possibly to ignorance of methods of abortion or a realization that abortions are dangerous and more costly than infants. Poverty, when requiring the mother to work in factories to the last days, is an important causative factor in causing abortions, miscarriages, and premature births. Germany, Denmark, Holland, and Switzerland have laws regulating the employment of women in the latter months of pregnancy. No such laws exist in the United States, and their enactment and enforcement by our cities would prove of great value. Regulation of employment would in some cases seem to make hardships, as these mothers work only out of necessity to help to support the family. These conditions, if they arose, could easily be met by the organized charities. Unfortunately a few charities when applied to for aid send mothers to work during pregnancy and soon after delivery encourage weaning, to admit of the mothers returning to work. To aid in the reduction of infant mortality, especially in the first month, charity must be freely dispensed when asked by pregnant women, and the aid must be furnished without red tape. I have known women in the last months of pregnancy to be compelled to work 10 hours daily sewing at a machine and earning about 12 cents a day. Added to which work she has the responsibility of care of her other children and household duties. Where such cases can not be met by the private charities the municipal government should support such families for a few months.

Abortions and miscarriages, when due to disease of the woman or the generative organs, could often be averted by early thorough examinations and treatment by the medical attendant. A lessening of the social evil by education of the public through campaigns by health departments and others will, in time, give results.

Stillbirths, which invariably include those born and living a few moments to a few hours, have been estimated by available statistics to be 2 to 5 per cent of the total number of births. For various reasons these deaths are not included in the general mortality rate. That this mortality remains stationary, and possibly has increased, is shown by the following rates for the past 10 years in the city of Philadelphia:

Births, stillbirths, and premature births in the city of Philadelphia, 1902–1911.

Year.	Births.		Stillbirths.		Premature births.	
	Number.	Rate per 1,000 population.	Number.	Rate per 1,000 births.	Number.	Rate per 1,000 births.
1902	29,841	22.1	1,382	46.3	527	17.7
1903	31,028	22.6	1,323	42.6	778	25.1
1904	32,223	23.0	1,788	55.5	499	15.5
1905	33,339	23.4	1,903	57.1	457	13.7
1906	34,771	24.0	1,841	52.9	497	14.3
1907	35,142	23.8	2,004	57.0	565	16.1
1908	36,641	23.7	2,036	55.6	609	16.6
1909	37,540	24.6	1,827	48.7	602	16.0
1910	38,676	24.9	2,026	52.4	500	12.9
1911	40,044	25.3	2,131	53.3	559	14.0

The same causative factors for abortions and miscarriages are responsible for stillbirths, added to which is carelessness or ignorance by the attending physician, midwife, or student. Stillbirths and deaths during labor from accidents and injuries can be studied with the deaths occurring during the first week and the first month of life. An analysis of the mortality census of the United States for 1910 shows that 41,431, or 80 per cent, of the 58,000 deaths in the first month are due to premature births, congenital debility, injuries at birth, malformations, and convulsions. From these and similar statistics from other countries, one can make but one logical deduction, namely, that somewhere, and by some one, there are lacking the necessary precautions for protection of mother and child in maternity. There seems to be many ways in which the municipal governments could aid in such protection by interest and supervision. With the recent advances in medical skill and preventive medicine, most of these early deaths should be included in the class of preventable diseases. The question to consider is how the proper municipal authorities can help in assuring proper care and nourishment during the period of pregnancy and in giving financial aid when needed. How to best educate the mother in seeking early competent medical advice and treatment, assuring skilled medical supervision during labor, and careful nursing of mother and baby for at least two weeks, and observation past the first month of convalescence. Investigation of these early deaths in many cases shows a total lack of hygiene during pregnancy and lack of care and skill during and after delivery. There must be a realization that childbirth is not merely the period of labor, but an equally important period of gestation, as well as three to four weeks of convalescence following the birth of the child.

Obstetrical cases are attended by physicians, midwives, and students. They are attended at home, in hospitals, and private maternities. The accoucheur is morally and should be legally responsible for the entire time. · This responsibility must include both mother and baby, from the time the physician or attendant is first consulted, until the infant has a start in life. Most women engage the services of some one at least one to two months before labor. A small percentage consult a physician only when labor begins, and in the State of Pennsylvania, it has been estimated that 5 per cent of the births are unattended by any medical attendant or midwife.

In Pennsylvania there were, in 1911, 210,000 births, 35 per cent of which were attended by the 3,000 midwives in the State, 15 per cent by hospitals, dispensaries, and maternities, 5 per cent without attendance, and about 45 per cent by physicians. In Philadelphia during 1911, there were 40,666 births, 25 per cent being attended by midwives, 5,825, or 14.5 per cent, by hospitals, maternities, and dispensary outdoor service. As many physicians connected with hospitals, especially teaching institutions, report all births under their name, this factor would reduce, below 60 per cent, the true number of obstetrical cases attended by private physicians.

It is not my intention to discuss the relative efficiency of the different classes of obstetricians. The physician is licensed by the various State medical examining boards after a course of training in more or less reputable medical schools. Such courses of study are supposed to include a practical training in applied obstetrics. The responsibility of supervision by the State is complete when its medical examiners make the requirements to obtain a license to practice medicine in all of its branches sufficiently stringent to exclude those applicants who are incompetent. The remainder of the responsibility is up to the medical colleges.

Fifteen per cent of the births are reported by hospitals and dispensaries, the greater number of these cases being attended by students. This training is needed to assure a practical course for the students. We should, however, demand that all cases be under the direct supervision of competent instructors. This would not detract from the value of the teaching, but, on the contrary, add to the training. It should be compulsory for the students to visit all expectant women assigned to them for delivery frequently during the last two months of pregnancy and report conditions to the instructors. They should also be compelled to make daily visits for at least two weeks following labor, giving similar reports on mother and baby.

Sixty-one hospitals and dispensaries in Philadelphia report births, and over 80 per cent of these births are reported by 12 hospitals that have students. Three of the hospitals having students have five trained nurses for the outdoor service.

No nurses are employed by other hospitals doing obstetrical work at homes and not having students. None of the nurses visit the expectant women previous to the time of labor. It must be evident that these existing conditions must materially increase the mortality among infants in the first month, especially from stillbirths, premature births, accidents, and congenital debility.

There can be little dispute that a well-regulated maternity hospital is the ideal place for obstetrical cases, especially where the facilities and conditions are wanting in the home. There remains one weak place in this supervision—inability to observe most cases in the last month of pregnancy and the too early discharge of mother and baby. This disadvantage could be met by visiting nurses going to the homes of all cases discharged from the maternity wards of a hospital, such visits to continue until the baby and mother have entirely convalesced. Where needed, homes should be supplied for those mothers requiring further care after discharge.

There should be legislation which would require all hospitals and dispensaries conducting an outdoor service to report to the health officer the names and addresses of all expectant women presenting themselves at these institutions for confinement. The city authorities should have trained nurses detailed to visit these prospective mothers during the last month or two of pregnancy, observing any signs of abnormality, instructing the mother in personal hygiene, care of the breasts, and preparing the mother for the time of labor. The nurse should continue her visits after the birth of the child, in order to instruct in the care and feeding of the baby. Such precautions would reduce materially the early deaths by avoiding many accidents and would also assure more breast-fed babies. In such work the visiting municipal nurse would be a logical solution of the midwife problem. Foreign mothers, realizing the care and attention given to them, would naturally wean themselves away from the services of careless and uncleanly midwives, and those midwives remaining in practice would be compelled to become more skilled and painstaking in their work.

Private maternities should be abolished by legislation. Such institutions have no excuse for existence. Most cities have ample hospital accommodations for obstetrical cases, both pay and charity. These private maternities, with but few exceptions, are existing only for illegal and illegitimate work. Laws licensing and regulating their practice seem to be of little value. These institutions are difficult to locate and then difficult to supervise. Philadelphia, with laws, rules, and regulations for licensing private maternities, has succeeded in granting licenses to 28 in the past 10 years. Eight of these had their licenses revoked, and all others except five failed to renew their licenses. They have reported 329 births in the past four years. I am confident that many unlicensed maternities exist. Of the seven licensed maternities remaining in 1911 the department revoked the license of one for illegal and irregular work and caused the arrest and conviction of another for trafficking in babies. These maternities deal almost entirely with the illegitimate births and pave the way for disposal of the infants. They have been known to agree to relieve the mother of her baby for a stated sum. If the child does not die in the institution, it is placed out to board, and the longer the child lives the less is the profit for the institution.

The death rate among the illegitimate births is large. This could be materially decreased by the public hospitals and maternities encouraging the use of their wards, and impressing on the mother that there will be strict professional secrecy upon which she can rely.

The midwife of late years has been much discussed and abused. In some foreign countries she holds sway, but with numerous institutions for her training and continuous supervision by the governments her work is more or less successfully under control. In the United States, although she attends to 40 to 50 per cent of the births, few cities have strict supervision over her. In Philadelphia the midwife attends to 25 per cent of the obstetrical cases, in New York about 45 per cent, and in Chicago about 85 per cent. If she were to attend only to normal cases of labor a number of midwives would perform their duties well. But labor must include pregnancy and the period of convalescence. How many midwives examine their patients previous to labor? And, if they did, how many are trained to observe an abnormality? While they are trained and licensed to attend to normal labor, who knows at what moment a seeming normal case may become abnormal? Licensing and supervision can accomplish much, but few American cities have such supervision. These laws should be properly constructed; not too highly specialized and not so radical that there is little possibility of securing a full enforcement and satisfactory results. Licensing, without supervision by the health authorities, is worthless. Supervision which includes only an examination of their outfits and an occasional inspection of their homes accomplishes little. Talk of abolishing midwifery is sheer nonsense. A profession of the proportions of midwifery, with sufficient hold on women to attend to 40 to 50 per cent of the cases, can not be abolished by the mere enactment of laws. Education of the mothers may, in time, win the women to safer and saner methods of intrusting their lives and the lives of their offspring. But we must supply the substitute for the midwife, and it must be a good one.

While waiting for the physician to take his rightful place in obstetrics, every municipality should license all midwives and keep a strict supervision over them. A midwife should not only report all births within a few days after delivery, but should be compelled to report to the health department all cases for which her services are engaged. To these cases should be sent a visiting nurse to observe and report on conditions until mother and infant are fully convalesced. One of the large visiting-nurse societies makes the grave mistake of refusing to send a nurse to any case under the care of a midwife. It is thus withholding its help where it is most needed.

In an overzealous desire to furnish breast feeding a number of institutions and physicians scour the cities for wet nurses. Mothers are found to accept the position of wet nursing for children deprived of their birthright. These women are often forced to wean their own infants and board them out, in which case they invariably die. The mother does this only because she needs the income to live. Often she is unmarried or deserted by the father of the child, and is too willing to sacrifice her baby. The institution or physician is unconsciously guilty of sacrificing one life for another.

Health departments should control, by licensing and supervising, all women engaged as wet nurses. A physical examination should be made of the applicant and a report made on the disposal of her own infant and her ability to nurse two children.

The practice of boarding infants is more common than suspected. It is a problem which has been difficult of solution. When the children are wards of the city care can be exercised in the homes utilized for this purpose, and by frequent inspections a supervision can be maintained over the care of the infant. These women should receive careful instructions in the care and feeding of infants. Even more care is needed in the infant not a ward of the city who is boarded out. The mortality among these, as well as among wards, is great.

The mortality in foundling institutions is estimated at 50 per cent and over. This is due, not to neglect, but to inadequate care, too few nurses and attendants, and too little individual attention. Infants may thrive with but little effort at home, but in an institution they require much care, attention, and thought. There should be frequent inspections of all such institutions by health officers. The number of infants allowed under the care of one nurse should also be defined by law.

Philadelphia has, by act of legislature, the right to license and supervise all houses boarding three or more infants under the age of 3 years. This limitation is a grave mistake. Every city should have supervision over every infant boarded. Every woman acting as a foster mother to even one baby should be investigated in her home, and the boarded infant inspected at frequent intervals. In a law with such limitations, while you protect the threes, or more, the ones and twos are left to die.

There is much of interest that could be added to this contribution, but I have omitted detailed descriptions and statistics and offer this brief study to evoke discussion that may aid in solving the problem of reducing the mortality among infants, especially in the first month of life. Not only is the number of these early deaths augmented by lack of care and by neglect, and ignorance during the puerperal period, but a considerable number of the inmates of our institutions are those who have survived the dangers.

DISCUSSION.

Mrs. William Lowell Putnam, chairman of the Committee on Infant Social Service of the Woman's Municipal League of Boston: What Dr. Newmayer has said about the importance of prenatal care interests me very much, for we have, for over three years, been doing prenatal work in Boston through a committee of the Women's Municipal League.

In this time we have carried to confinement 1,267 women. There has been no death in pregnancy during the whole period, and but three of our cases have died in childbirth. I can not agree with Dr. Newmayer that it is time enough for the women to register when they are within two or two and a half months of confinement. Our most interesting case was that of a woman who had been under our care for a short time with her first baby. She had a contracted pelvis, and the baby was injured by a high-forceps delivery and died of cerebral hemorrhage within a week of birth. With the second child, whose picture, at 19 months old, hangs in our exhibit here, she put herself under our care at once, and the picture speaks for the result. With the third pregnancy, she followed the advice of her neighbors, who said the sixth month was early enough to register, and, at five months, she miscarried.

Besides the number of women carried to confinement, we have cared for 200 to 250 others for as much as a month or more, who, for some reason or other, were lost sight of. Among all of our cases we have had but three miscarriages. Two occurred during the first year, one in the second, and none at all for the past two years.

Another interesting result has been the reduction in the number of cases showing symptoms of threatened eclampsia. The first year of work it was 10.2 per cent, a fairly average number; the second year it had dropped to 4.8 per cent; and in the third year it was only 1.7 per cent—a decrease of 600 per cent. Among the whole number, we have had four cases develop, and we are now not only testing the urine, but taking the blood pressure at every visit, in the hope of learning something which may help to prevent these cases. The cases are plotted on a chart—20 cases to each chart, and five of these charts are hanging up in our exhibit. We never allow more than 10 days to pass between the nurse's visits, and, if anything is wrong, she goes as much oftener as may be necessary. The number of stillbirths has been 2.7 per cent and the number of premature babies 1.89 per cent. Counting all of these, the birth weight of our babies has been 8½ ounces above the general average as given by Dr. Whitridge Williams, and the cost of the work is $2.61 per patient. This sum we encourage the women to pay wherever possible, for we believe that it is much better for them to do so, and also feel that a self-supporting work is capable of indefinite development, which can never be the case with one supported by charity.

It seems to us that the results, both to the women and to the community, justify the cost of the work.

THE PROPHYLACTIC AND THERAPEUTIC VALUE OF FRESH AIR IN SCHOOLS AND HOSPITALS, INCLUDING HELIOTHERAPY.

[Illustrated by lantern slides.]

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The title of my paper does not fully express what I wish to talk about this morning, for what I have in mind is not so much the air within the school and within the hospital as it is the absolutely pure fresh air to be found just outside their walls. Not all of our school children nor all of our hospital patients can be taught or treated in the open air, but a very large proportion of those who need it most can enjoy this privilege, and it should be our duty as physicians and guardians of the public health to see that they get it to the largest possible extent. Those who must remain indoors should receive the maximum amount of fresh unaltered air that can be admitted through open windows and transoms. I shall attempt to show rather by pictures than by words what has been accomplished in schools and in hospitals up to the present time.

It was a long time after the discovery in 1882 of the bacillus of tuberculosis by Koch before the outdoor treatment of pulmonary tuberculosis became thoroughly established. But many years before 1882 tuberculosis of the bones and joints and glands in children, known probably then as scrofula, was treated in the open air. The hospital at Berck on the coast of France was established by the city of Paris in 1861, the French believing that this form of tuberculosis was favorably influenced by the air from the sea. Even long before this date, in 1797, a hospital was founded by two English physicians at Margate, on the coast of England, for scrofulous disease in adults as well as in children.

This is the only institution of the kind in England, but on the Continent there are between 75 and 80 marine sanitoria, situated on the Baltic, the North Sea, the Atlantic Ocean, the Mediterranean, and the Black Sea. The original municipal hospital at Berck has been followed by several large private institutions, so that there are now at Berck between two and three thousand beds for children with surgical tuberculosis, about half of them maintained by the city of Paris, the others supported by private endowment. In 1904 the Association for the Improvement of the Condition of the Poor of New York, impressed by the favorable results obtained at Berck, decided to establish a small hospital for children with surgical tuberculosis at Sea Breeze, the summer home at Coney Island, which has been maintained for many years by the association for the children of the tenements of the city. The number of beds is restricted to 43, but now that the city has finally purchased Rockaway Beach we have reason to expect that a new hospital with 150 beds will be constructed and completed in the course of the next two years. The board of estimate and apportionment has voted to accept the hospital, for which $250,000 has been subscribed, as soon as it has been completed by the association, and to maintain it hereafter as a city institution. I shall content myself with showing a few pictures of the daily life, by night as well as by day. What I have seen at Sea Breeze during the past nine years has led me to urge that not only our patients with pulmonary tuberculosis or with surgical tuberculosis should live in the open air, but that all of our patients, whatever their disease may be, and all of our school children, whether predisposed to tuberculosis or not, shall be placed in an atmosphere approximately the same as that out of doors.

At Berck, as at the other European seaside sanitaria, the children pass the day on the beach or on balconies open to the air and sunshine. This régime was adopted at Sea Breeze, and in the nine years since the opening of the hospital there has not been a day, in all seasons and in all weathers, that the children, including bed cases, have not been in the open air. At night the windows of the wards are wide open throughout the year. In the warm season the sashes of the windows are entirely removed. From April to November about one-third of the children, as many as can be accommodated, sleep on the open porch. Throughout the summer months the ambulant children bathe in the ocean every day, and the nurses repeatedly call attention to the rapid improvement of the patients and the closing of sinuses under the influence of the sea water. During school hours the children are in a room with open windows or in a tent open on all sides, a teacher and a kindergartner being supplied by the board of education.

The good results obtained with the children at Sea Breeze were so striking that it was decided to provide open balconies in all the hospitals then in process of construction in the department of Bellevue and allied hospitals. Every ward has at least one balcony attached to it, so that every patient, whatever his disease, may have the benefit of the outdoor air. In addition to the balconies there are large wide loggias at Bellevue and extensive lawns and roof gardens at all the hospitals but one. Gradually storm sashes and louver windows are being added to the balconies, so that even in the winter the patients can be moved out of doors, one or more sides of the balconies being always open for the free entrance of the outer air.

It is unnecessary for me to emphasize the stimulating effect of this treatment. In one disease, the acute pneumonia of children, an attempt has been made to reduce the results to figures. Previous to November, 1908, the children with pneumonia were cared for in a large sunny ward in the old building. The ward was fairly well ventilated, but there was no opportunity for outdoor treatment. After moving into the new building it became customary to place the children on the balconies for three or four hours a day, unless the weather was too stormy. The good effects of the fresh air were so noticeable that in January, 1910, it was decided to place the patients on the balcony as soon as the diagnosis of pneumonia was made, and to keep them there throughout the 24 hours, and this practice has continued up to the present time. It was noted that the patients, with rare exceptions, improved in all their symptoms, especially during the winter months, but no comparative study was made until a few months ago. The results of this study are as follows: From January, 1904, to November, 1908, 274 children (1 year of age and over) were admitted to the hospital, and of these 69 died, a mortality of 25.2 per cent; in the second period, from November, 1908, to April, 1912, 391 children (1 year of age and over) were under treatment, of whom 42 died, a mortality of only 10.7 per cent. The observations of Dr. John Howland, the attending physician in charge of the children's service, and his assistant, Dr. B. Raymond Hoobler, apparently show that this remarkable effect of the outdoor treatment is largely due to the increased blood pressure caused by the fresh cold air. As these studies have been published, I shall not refer to them in detail, but simply state that the rise of the blood pressure out of doors was attributed by these observers to the reflex stimulation of the vasomotor centers by the action of the cold air on the skin of the face and the mucous membrane of the nose.

Infants under 1 year of age are also placed in the open air as soon as the diagnosis of pneumonia is made, and adult patients are treated on the balconies or in a room with the windows open so that the temperature approximates that out of doors. These patients uniformly do well. The effect of the cold air in quieting the restlessness and delirium of pneumonia, especially in alcoholic subjects, is very striking.

Maternity cases are removed to the balcony in from 4 to 7 days after delivery; during the warmer months within 36 hours in some instances. The good effects are evident to all, and particularly to the women themselves. The nurse in charge states that the patients sleep better and call for less attention than when in the ward. A week or 10 days' (and nights) outing on a Bellevue balcony is not a bad substitute for Lakewood or Atlantic City.

Dr. Gregory, the hospital alienist, reports that the effect of open air upon the acute insane is very beneficial, especially in the excited and restless. It has a quieting influence and induces sleep. The same is true of the alcoholic patients, of whom there are thousands in the hospital annually. The fresh air and oxygen seem to furnish the stimulation which they greatly need, so that they eat and sleep well. It has been Dr. Gregory's experience that if alcoholics be kept in the open air they will recover much sooner than if kept in the wards. The tremulousness and anorexia and mental depression disappear very quickly. In functional nervous diseases the value of the open-air treatment is generally recognized. It induces sleep, improves the appetite, and supplies the general stimulation which patients of that class require.

Patients after severe operations gain rapidly when taken out of doors. In critical cases the stimulus of the fresh air often seems to turn the tide. The patients themselves are prompt to show their gratification, especially the women.

Passing on to the consideration of the open-air schools, we may divide them into three groups—first, those for children with pulmonary tuberculosis; second, those for children who are anemic, under weight, and ill nourished, and hence considered to be especially predisposed to tuberculosis; and, third, those for normal school children who are neither tuberculous nor predisposed to tuberculosis or any other disease.

The open-air school movement began in 1904 with the "Waldschule" at Charlottenburg, and was followed in 1907 by the outdoor school at Bostall Wood in the outskirts of London under the auspices of the London county council. Other schools were soon established in various parts of England, of which those at Bradford and Sheffield are perhaps the best known. In January, 1908, the movement spread to the United States, and with the opening of the school term this autumn there will be in operation over 200 fresh-air schools and classes for tuberculous, anemic or normal children, according to a statement of the National Association for the Study and Prevention of Tuberculosis. In Germany and in England structures especially designed were erected. In this country we have been content as a rule to make use of buildings already in use, either by selecting a room facing the south and altering the windows or by covering and partially inclosing a portion of the space on the roof.

The first school in the United States, with the exception of the hospital school at Sea Breeze already referred to, was opened in Providence. This was followed closely by the Franklin Park School in Boston. The Providence school is in an abandoned schoolhouse from which a portion of the south wall was removed and replaced by windows which can be trussed up to the ceiling. The class in Boston is on the roof of a building built for a refectory in a public park. It is freely open on all sides: protection in stormy weather is secured by curtains which can be dropped as desired. The results obtained in these schools were so satisfactory that they were soon followed by the establishment of similar classes in Hartford, Chicago, New York, and other cities. These schools vary greatly in their construction and arrangement. but they all agree in supplying fresh air in abundance to the pupils. In Hartford the class is held in a tent; in Chicago and in New York some of the classes are on the roofs of school or hospital buildings. In the Graham School in Chicago the fresh air is obtained simply by raising the windows of an ordinary schoolroom. Two of the New York schools are of especial interest, being located on the upper deck of old ferryboats.

Most of these classes are for tuberculous children who have been excluded from the public schools. The régime is the same in all—life in the open air. nourishing food. rest in bed after dinner, and the systematic use of gentle exercises. The results also are practically the same in all—gain in weight. disappearance of the physical signs, and improvement in general condition, both physical and mental. The teacher of the class on the *Gouverneur* ferryboat reports that of 37 children who had been in the class for periods varying from six months to a year, 30 had been readmitted to the public schools by the physicians of the board of education. It should be added that the pupils have not only regained their health, but have also kept pace in their studies with the other children.

In the second group of open-air schools belong the classes for anemic children established in the public schools of New York by the board of education. The children in these classes have no physical signs of disease, except enlarged glands in some cases, but they are anemic. under weight, ill nourished, and many of them from tuberculous families. The first class was opened in April, 1910, in public school No. 21. in Mott Street, the center of the congested Italian quarter. Forty such classes have been authorized by the board of education and at the present time 20 are in successful operation in various parts of the city. The same routine is followed as in the schools for tuberculous children. The food is provided by the committee on tuberculosis of the Charity Organization, a private society, all other expenses being met by the city, through the department of education.

The results in all the fresh-air classes are excellent. During the first winter the children in the Mott Street School gained on an average of 6 pounds apiece, with a corresponding improvement in all other respects. The increase in hemoglobin is especially interesting, starting at an average for the class of 71 per cent in the autumn the figures reached 85 per cent in the spring, whereas a control class of normal children in the same school declined from 87 per cent to 81 per cent during the same period of time. At the end of the school year the 21 children had so improved that they were returned to their former classes and a new group of anemic children took their places. Dr. Doty, the superintendent, reports that practically all the children in the school are anxious to join the fresh-air class.

As the cost of the extra food is considerable and seemed likely to limit the number of open-air classes, it was decided to lessen the amount of food in the new classes, and in some instances no extra feeding at all has been furnished, the children having only the usual dinner provided at home. As far as can be judged by a few months' trial the children in these later classes are doing nearly as well as in the original class of school 21.

The third group of open-air schools, those for normal children in the public schools, is in some respects the most interesting and full of promise for the future. Having demonstrated that pure air, fresh from out doors, can be given not only with safety but with great benefits to school children who are tuberculous or whose health is otherwise impaired, the next step is to give fresh air to all school children. A fresh-air class was opened last winter in public school No. 9 at the request of a number of parents of the children. With the permission of the board of education the room was cut off from the ventilating and heating system of the school building and the windows were kept open as in the anemic classes. The children receive no extra food, as the parents are well able to provide for them at home. Classes have also been opened—10 in all—in various private schools in different parts of the city. In Boston, Chicago, and other cities the movement for fresh-air schools for normal children is also making progress, so that it would seem to be only a question of time when all children will be taught in the open air.

In conclusion, I should like to say a few words about heliotherapy, limiting myself to its use in surgical tuberculosis, especially as practiced by Rollier at Leysin, in the Vaudois Alps, Switzerland. Rollier established his hospital for the treatment of tuberculosis of the bones and joints as long ago as 1903, and has presented papers on the subject at at least three international congresses, but it is particularly during the last two years that his work has attracted attention. Other physicians had made use of the sun cure on the shores of the Mediterranean, joining it to the "cure marine," and Bernard had practiced it in the pure mountain air of the Engadine. It was the work of Bernard that led Rollier to select an elevated site for his hospital. I shall speak but briefly of his methods and his results, as the lantern slides present both so clearly that but little word description is necessary.

Leysin is situated at an altitude of about 4,500 feet above sea level. The hospital buildings face the south and are protected by mountain ranges from the cold winds of the north and west. Rollier states that even in midwinter the temperature on the sunny balconies is often as high as 45° to 50° F. Owing to the purity of the atmosphere and the absence of moisture there is no loss of the luminous and caloric radiation of the sun. The exposure to the sun is gradual, beginning with five minutes three times a day. This is steadily increased as pigmentation of the skin appears, until finally the entire surface of the body is exposed from sunrise to sunset. The head is protected as shown in the illustrations. With the development of the pigmentation the cure progresses until the recovery is complete; how complete it is may be seen from the picture of the two boys, the first of whom had 32 foci of tuberculosis, even the lungs being involved; the second, multiple lesions, including a badly disorganized anchylosed elbow, with seven sinuses and a history of three resections of the joint and forearm. Fever was present in both cases. After one year's treatment both boys are well, with complete return of function—full flexion and full extension—in the elbow of the second boy. I am not an orthopædic surgeon, but I know what is considered as a cure of a tuberculous joint. I have seen many such cures at Sea Breeze. Arrest of the disease with anchylosis of the joint in as useful a position as possible is accepted as a satisfactory result.

REMARKS ON THE ANTHROPOLOGICAL STUDY OF CHILDREN.

Prof. FRANZ BOAS, Columbia University, New York City.

If I venture to lay before you some brief remarks on the anthropological study of children, I do so for the reason that problems of hygiene are necessarily based on the consideration of the anatomical, physiological, and pathological conditions of masses of individuals, phenomena with which anthropological science is intimately concerned, for anthropology deals with the racial and social influences that determine form and function of the body, without reference to the peculiarities of the individual as such, although the range of variations in form and function that are found in a social group constitute a most important topic of our investigations. I wish to deprecate, therefore, at the outset all attempts at an individualistic interpretation of our results, which express only the general conditions that have to be considered in a study of the life of the individual, and which are modified in each individual by his peculiar life history and hereditary conditions that can not be expressed in our generalized results. Nevertheless, the importance of these is great, for they express in a concise way the general effects of social and racial conditions that can not be formulated in any other manner, and set definite problems to the student of hygiene as well as of anatomy and physiology.

The phenomena that interest us here are those of the development and growth of the child. The first attempt to study growth by metrical methods was made by Quetelet, in Belgium; but our first accurate knowledge is due to the investigations of Henry P. Bowditch, in Boston, and, later on, to those of Roberts, in England. These were followed by work on similar lines in America, Italy, Germany, France, Russia, and Japan. New lines of research were developed by the application of more rigid biometrical methods, the development of which we owe in large part to the influence of Francis Galton and to the work of Karl Pearson.

The results of these studies and the present status of the problem may be summarized as follows: The rate of growth of the body, measured by weight and stature, increases very rapidly until the fifth month of fetal life. From that time on the rate of growth decreases, first rapidly, then more slowly, until about four years before the age of puberty. During adolescence the rate of growth is considerably accelerated, and decreases again rapidly after sexual maturity has been reached. Thus the curve of growth represents a line which possesses a very high maximum at about the fifth month of fetal life. It decreases rapidly, and has a second although much lower maximum shortly before sexual maturity is reached, and not long afterwards reaches the zero point. The increase in bulk of the body continues much longer than that of length. In the beginning the rates of growth of the two sexes are about equal, that of the male probably exceeding slightly that of the female. Since, however, sexual maturity begins to develop earlier in the female than in the male, the concomitant acceleration also sets in at an earlier time, with the result that for a few years girls have a larger bulk of body than boys.

Although the periods of most active growth of the parts of the body differ considerably, it would seem that the characteristics of the curve of growth as here outlined are repeated in many if not in all organs and parts of the body. For instance, although the head reaches nearly its full size at an early time, so that its rate of growth shows a much more rapid decrease with age than that of the bulk of the body, there is an acceleration of growth during the period of adolescence. The differences between the sexes are in this case quite marked in early life, the head of the girl being always considerably smaller than that of the boy. The early prepubertal acceleration of the girl is not sufficient to bring the head measurements of girls up to those of boys, even during the prepubertal period. The difference in the measurement of the sexes is, therefore, not by any means solely due to the shorter period of development of girls, as might be supposed from a study of stature and weight alone, but important secondary sexual characteristics exist in early childhood.

These prove that the difference in physiological development between the two sexes begins at a very early time, and that in the fifth year it has already reached a value of more than a year and a half.

I give here a tabular statement of the available observations:

	Age in years.		Difference.
	Boys.	Girls.	
Ossification of scaphoid	5.8	4.2	−1.6
Ossification of trapezoid	6.2	4.2	−2.0
Eruption of inner permanent incisors	7.5	7.0	+0.5
Eruption of outer permanent incisors	9.5	8.9	−0.6
Eruption of bicuspids	9.8	9.0	−0.8
Minimum increase of annual growth	10.3	8.2	−2.1
Eruption of canines	11.2	11.3	+0.1
Maximum increase of annual growth	13.2	11.2	−2.0
Eruption of second molars	13.2	12.8	−0.4
Maximum variability of stature	14.8	12.4	−2.4

These data are not very accurate and must be considered a first approximation only.

When we remember that growth depends upon physiological development, it will be recognized that we must not compare the stature of girls of a certain age with that of boys of the same age, but that from the fourth year on a girl of a certain age should be compared with a boy a year and a half older than she is.

If this view is correct, then it appears that the relation in size of the two sexes persists even in childhood.

I think no better proof can be given of the correctness of this view than the peculiar behavior of those parts of the body which complete their growth at a very early time; for instance, that of the head. The total amount of the growth of the head from the second year is very slight. If, therefore, girls are ahead of boys in their development by about a year and a half or two years, the total amount of growth of the head in their favor will be the small amount of growth accomplished during this period of a year and a half or two years. If, then, there is a typical difference between the size of the body of male and female in childhood of the same character as found in adult life, then the head of the girl ought to be at all periods smaller than the head of the boy; and this is what actually happens. The phenomenon has been interpreted as indicating a less favorable development of the head of the woman; but the previous remarks show that it is obviously due solely to the different rate of physiological development of the two sexes. The results of physiological tests which show very generally that girls do better than boys of the same age, may be another expression of the general acceleration of their development.

While we may thus speak of a curve of growth and development of the whole body and its organs, which has characteristic values for each moment in the life of the totality of individuals that compose a social group, not all the individuals pass through these stages of development with equal rapidity. It is easiest to make these conditions clear to ourselves by stating the various ages at which certain points in the physiological development of the individual are reached. Data are available for the periods of pregnancy, eruption of teeth, pubescence, sexual maturity, and development of long bones. So far as these can be reduced according to fairly accurate methods, the following results have been obtained: The average period of pregnancy is 269.4 days. One-fourth of all the children observed have been born in the periods of pregnancy between 265 and 273 days, one-half, between 260 and 278 days, and three-fourths, between 254 and 285 days. According to the laws of large numbers, the ratio of children born between any other limits of time can be determined, if any one of the pairs of values here mentioned is known: for instance, the pair which indicates the limits in which the middle half of all the children are born. In our case these limits are, accurately speaking, 269.4 days (the average), plus and minus 9 days. We may, therefore, call 9 days the measure of the variability of the period of pregnancy. I repeat that this means that one-half of all the children are born within the period limited by 269.4 days (the average), minus 9 days (i. e., 260.4 days), and plus 9 days (i. e., 278.4 days). In this way the following variabilities have been determined:

	Age (years).	Variability (years).
Pregnacy	0.0	±0.09
First incisors	.6	± .14
First molars	1.6	± .20
Inner permanent incisors, girls	7.0	±1.10
Inner permanent incisors, boys	7.5	± .90
Outer permanent incisors, girls	8.9	±1.40
Bicuspids, girls	9.0	±1.90
Outer permanent incisors, boys	9.5	±1.40
Biscuspids, boys	9.8	±1.10
Permanent canines, boys	11.2	± .90
Permanent canines, girls	11.3	± .70
Appearance of pubic hair, boys (Boas)	12.7	±1.60
Second molars, girls	12.8	±1.10
Second molars, boys	13.2	±1.30
Appearance of pubic hair, boys (Crampton)	13.4	±1.00
Full development of pubic hair, boys (Boas)	14.6	±1.10
Full development of pubic hair, boys (Crampton)	14.5	± .90
Puberty, girls	14.9	±1.30
Wisdom teeth, boys	19.3	±1.40
Wisdom teeth, girls	22.0	±1.20
Menopause	44.5	±3.90
Death due to arterial diseases, men	62.5	±8.80

It appears, from this table, which may be represented in the form of a curve, that the variability of the physiological stages of development increases very rapidly, probably so that its logarithm is in a ratio approximately proportional to the actual age, or, to use the term applied by Dr. Crampton and Prof. Rotch, to the chronological age. The causes that lead to this rapidly increasing variability are so far entirely unknown. It is certain, however, that there must be definite causes at work which bring about this phenomenon; for, if the variability were due to accidental causes only, it would increase considerably slower than in a ratio proportional to the increasing age, namely, proportional to its square root. The study of the general curve indicating the increase of variability in physiological development points to an irregularity at the time of approaching maturity. At this period the variability seems to increase at an unusually rapid rate, and either to be stationary or to decrease again at a later time.

I have spoken here of the variability of the physiological development of the body as though this were a unit. In 1895, in a discussion of Porter's observations on the growth of school children in St. Louis, I pointed out the fact that a general variability in physiological development accounts for the close correlation between the distribution of children of the same age in school grades and the variations in the size of the body and its organs; and this problem was later on worked out by myself and by Dr. Clark Wissler in regard to various measurements. These correlations have also been proved in a most interesting manner by Dr. Crampton's observations on pubescence, and by Prof. Rotch's study of the development of the epiphyses. It is true that a close correlation between the states of the physiological development of the various parts of the body exists, but there exists also a certain amount of variability in the development of one organ when another one has reached a certain definite stage. The correlation is so close that the condition of the bones, or that of pubescence, gives us a better insight into the physiological development of the individual than his actual chronological age, and may therefore be advantageously used for the regulation of child labor and school entrance, as Prof. Rotch and Dr. Crampton advocate; but we must not commit the error of identifying physiological development with physiological age, or of considering chronological age as irrelevant.

The clearest proof that is available is found in the data relating to increase of stature, and in observations on pubescence made according to Dr. Crampton's methods. Bowditch was the first to investigate the phenomenon of growth of individuals who are short or tall at a given age, but his method was based on a statistical error. Later on, I showed that retarded individuals possess a late acceleration of growth, and these results were amplified by studies made by Dr. Beyer and Dr. Wissler. Recently I had occasion to make a more detailed statistical analysis of the phenomenon of growth, which shows that individuals whose prepubertal accelerated growth begins late in life have rates of growth that exceed by far those of the normal individual; in other words, that, among the retarded individuals, the whole energy required for growth is expended in a very brief period. In the case of stature, the phenomenon is complicated by the great differences in hereditary stature among the various parts of the population. It appears more clearly in observations on pubescence. Thus it can be shown that, if the first pubic hair appears in one group of boys at 11½ years, and in another at 15½ years, it will take the former much longer than the latter to attain the full development of pubic hair, and the rate of change found among them will be much greater than that of normally developed individuals. In other words, individuals who exhibit the same stages of physiological development are not the same, physiologically speaking, if their actual chronological ages differ; their past is not the same, and prospective physiological changes in their bodies will proceed in different ways. It is clear, therefore, that the greater the retardation or acceleration in any one particular respect, the greater will also be the disharmonies that develop in the body, since not all the other organs will follow the same rate of acceleration and retardation. The causes of these phenomena are unknown, but we may perhaps venture on the hypothetical explanation that all the cells of the body undergo certain progressive changes with increasing age, and that the internal secretions which become active at the time of puberty exert a stimulus upon the cells which causes accelerated growth in the cells, which depends, however, also upon the state of development of those cells. This may refer to the whole body, as well as to the glands that have a direct influence upon the rate of growth. In retarded individuals many of the cells have advanced in their development more nearly normally than the groups of cells involved in sexual maturity; and when their action sets in the cells of the body are stimulated much more vigorously than the less developed ones of an individual that reaches maturity at an earlier time. This hypothesis, however, would have to be tested experimentally. It is intended only to bring nearer to our understanding the complicated phenomena of retarded and accelerated growth.

It seems very likely that the abnormally large amount of energy expended upon rapid growth during a short period is an unfavorable element in the individual development. A study of the phenomena of growth of various groups of the same population has shown that early development is a concomitant of economic well-being, and that for the poor the general retardation in early childhood and the later rapid growth are characteristic. It follows from this that there is a corresponding, although not equal, retardation in early mental development, and a crowding of developmental processes later on that probably place a considerable burden on the body and mind of the poor which the well fed and cared for do not suffer. The general laws of growth also show that a retardation kept up for an unduly long period can not be made up in the short period of rapid growth; so that it would seem that, on the whole, excessive retardation is an unfavorable element in the growth and development of the individual. Whether there are similar disadvantages in a considerable amount of early acceleration is not so clear.

A word may also be said in regard to the evident increase in the general statures of the people of Europe, which has been proved by the study of military statistics. I presume this is partly due to better nutrition and earlier development, but it seems likely that much of it may be due to the better control of infantile diseases, which exert a long retarding influence upon the growth during the earlier years of childhood.

When we turn from the more general phenomena of growth to a consideration of their controlling causes, particularly of the influences of heridity and of environment, we have to confess our ignorance of the most elementary facts. While there is no doubt that the bodily size of the parents determines to a certain extent the growth of the bulk of the body of the children, it is not by any means clear in how far part of this may be due to the controlling effect of environmental causes to which parents and their children are equally subject. It is quite obvious that the earlier in fetal life certain traits are formed, and the earlier they reach their full development, the stronger will be the heriditary influence; while the later in life the full development is attained the greater will be the influence of environment, not only on account of the longer time of its action but also owing to the greater diversity of its form. Thus, if the anterior part of the palate has very nearly reached its final form and size in the sixth year no amount of subsequent change of food or use will materially influence its form; while weight and stature, and, even more, mental development, will be modified by the influences to which the individual is subject during the first two or three decades of his life. The problem of growth must, therefore, be studied for every organ independently.

Some observations have been made that illustrate the influence of environment, not only upon growth of the bulk of the body but also upon some of the forms that develop very early in life. Thus, it has been shown that urban and rural populations in Europe exhibit characteristic differences in size and form of the head. These differences are slight, and the attempt has been made to explain them as due to selection or mixture; but reasons can be brought forward that suggest other causes for the modification of the bodily forms. It has also been observed that a fairly homogeneous people like the east European Jews develop distinctive forms in the different parts of Europe that they inhabit, and that Italians, Bohemians, and Jews who come to America develop distinctive characteristics. Whatever the causes of these changes may be, whether due to selection or to internal changes brought about by the new environment, they indicate that heredity is not the sole factor that determines the development of the body.

The few observations which we possess on the growth of children of different races seem to show that there are definite characteristics of the growth curve for each group. Thus, Indian children seem to be shorter than European children, while the adult Indian is as tall as or taller than the European; but it is impossible to tell in how far this is due to the mode of life and how far to the influences of heredity. It is not too much to say that all the work on these problems remains to be done. Our ignorance of these facts should make us hesitate to judge rashly of the mental and bodily inferiority or superiority of races, since the data for forming a judgment are entirely lacking, and since most of the features on which we are accustomed to form our judgment develop late in life, and are therefore, as explained before, to a great extent subject to the influence of environment.

Related to these questions is the problem of the period of development of racial traits. At a very early stage of development children of all races are much alike, and many of the most characteristic traits do not develop until maturity is reached. Traces of these racial traits may be observed at an early time, but their accentuation occurs comparatively late. Here we have undoubtedly traits that are determined by a long line of ancestors, not by environment. Thus, parts of the body that are alike in childhood are subject to a more active growth in one race than in another. For instance, the elevation of the nose of the European, the prominence of the face of the negro, the great length of the leg of the negro, the great width of face of the Mongol and Indian are due to a marked growth of these features. Others, on the other hand, lag behind. Thus we are confronted with the ontogenetic problem of the origin of the diversity of human types, and of the oft claimed but never proved phenomena of early arrest of development in certain groups.

On the whole, what little we know would indicate that the periods of growth are the same everywhere, but that the rate of growth is throughout proportionally greater in one group than in another, and that in this manner the racial characteristics are developed. Too little is known, however, to express any definite opinion on this important subject.

The subject is one that, in its general aspects, as well as in the questions relating to the influence of heredity and environment, has a direct bearing upon questions of social well-being and upon our estimate of racial characteristics, and for this reason deserves systematic study, not only for the sake of its scientific interest but also on account of its practical importance.

PHYSICAL EFFICIENCY TESTS DURING ADOLESCENCE.

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This paper can serve only as a preliminary statement and illustration of a method of study. The writer began the heart-rate and blood-pressure section of the study at Clark University in the fall of 1908. While a graduate student in the university personal observations of the Worcester, Mass., schoolboys, grammar and high, were taken. The study has been continued during the last four years with the aid of the following students from the International Young Men's Christian Association College: Messrs. Brock, Fette, and Yeager, 1910; Dittemore, Courleux, and Martin, 1911; and Deaver, Doane, Metzler, and Samson, 1912. Observations were made under the supervision of the writer on the Springfield, Mass., high-school boys.

The items studied were heart rate and blood pressure, pubescence, height, weight, strength, lung capacity, and scholarship. In both cities the cooperation of the school officials made the study possible. The method of generalized study was, after the first year's study, discarded in favor of the individualizing method, since it was found that the generalizing method gave no evidence of an abrupt pubertal rise of blood pressure as stated by Hall[1] in his adolescence and Tyler[2] in his growth and education. The aim of the study during the past three years has been to follow the same boys during the period of adolescence, with at least two examinations a year, rather than examining them for only one year. The generalizing method assumes that the boys who are, for example, 12 years old this year will be like the boys 13 years old a year from date. This method has been quite largely used. Dr. Bowditch,[3] in his study of the Boston school children, and Dr. Porter,[4] in his study of the St. Louis children, are well-known examples. The individualizing method follows the same boys during this period of maturing. This method has been followed by Crampton,[5] in his study of the New York City school children. Crampton's study indicates that there is a wide difference in boys of the same chronological age.

The aim of my investigation is an attempt to discover the way boys mature, and to relate that knowledge to methods of promoting their health and efficiency in school and in life. We should have norms of vigor which would give a fair index of the health and efficiency of the individual boy or girl. The school gives an index of the intellectual efficiency of the boy for these particular tasks. We have at present no common indices of vigor which are generally accepted. This study is an attempt to find such indices. It is, I think, the first attempt which has been made to correlate the factors of efficiency in the adolescent boy. The marks given in physical education practice are probably a closer index of motor efficiency than are the marks given in the classroom of intellectual efficiency, but they have not received such general acceptance. We need two new sets of indices:

First, indices of the intellectual health, organic soundness, and efficiency of the central nervous system.

Second, indices of organic efficiency. It has been generally recognized that the modern environment has affected unfavorably the health of the city dweller, if not that of one living in country places. While it is true that infectious diseases have decreased, it is also true that diseases of the nervous system, of the heart, and of the kidneys have increased. The environment and activities of children have markedly changed. First, they learn by going to school rather than by aiding their parents in their activities. Second, they use chiefly the highly specialized muscles used in speaking, writing, and close vision, rather than the large muscles of the legs and trunk. School education has increased the use of the accessory muscles and decreased the use of the fundamental muscles.

Third, the central nervous system is asked to function chiefly in its higher activities rather than in organic work.

On the basis of Hughlings Jackson's[7] three-level theory, which seems to be meeting with general acceptance by psychologists, we have—

(*a*) A lower or organic level controlling circulation, respiration. and nutrition, largely through the plain muscles and organic nervous centers, e. g., cardiac and respiratory.

(*b*) A middle level. which might be called the motor and sensory level. This is most nearly illustrated by Flexig's motor and sensory region.

(*c*) A highest level. represented in a general way by the association areas. which are still more complex and related to the higher intellectual processes and to moral judgments.

We recognize that the development of the higher centers are dependent on the proper development of the lower centers; that the health of the body is essential to the health of the central nervous system; but we often fail to see how intimate the relationship really is.

> Centers for the simplest movement of the limbs become evolved, in the higher centers, into the physical basis of volition. centers for simple reflex actions of eyes and hands are evolved, in the higher centers, into the physical basis of visual and tactual ideas. The low-level centers governing the tongue, palate, and lips in eating and swallowing are evolved, in the higher centers, into the physical basis of word symbols serving us during abstract reasoning.
>
> The lowest level centers, which control respiration, circulation, and nutrition, are evolved, in the higher centers, into the physical basis of the emotions.

The low-level or basal centers regulate the organic life, the high-level centers are related to the intellectual and emotional life.

The higher centers are built upon the lower ones. Intelligence and morality are related to the physical integrity of the lower centers.

In searching for indices of vigor, I have selected items which represent large organic efficiency in relation to maturity. The chief factors in physical efficiency are good organs, a stable nervous system, and a good environment.

I have taken the pubescent index, as outlined by Godin,[8] Marro,[9] and Crampton.[5] as the method of determining maturity. I have used the specific method of Crampton, whose three divisions seem more accurate than those of Godin or Marro. Crampton divides the maturing boys into P_1, prepubescents, those without visible hair on the pubes; P_2, pubescents, those upon whom has appeared a fine growth of pubic hair, with pigmentation; P_3, postpubescents, those who have the kink or twist of the pigmented hair. Godin gives the best description of the changes coincident with the appearance of puberty. Marro should be consulted in relation to the causes which retard or accelerate the appearance of puberty, such as climate, temperature, race, and hygienic conditions.

In the height and weight studies, 212 boys were examined. Fifty-one of these were examined five times between October, 1910, and March, 1912. The rest of the boys were examined in October, 1911, and March, 1912. The following tables show the growth rates:

Growth rates.

OCTOBER, 1910–MARCH, 1912; ONE YEAR FIVE MONTHS.

	Average gains 51 boys.	
	Height.	Weight.
	Inches.	*Pounds.*
Prepubescents (Doane, p. 24)	2.8	8.55
Pubescents (Doane, p. 26)	4.46	23.03

OCTOBER, 1911–MARCH, 1912; FIVE MONTHS.

	Average gains 212 boys.	
	Height.	Weight.
	Inches.	*Pounds.*
Prepubescents (Doane, p. 68)	0.73	5.45
Prepubescents changing to pubescents (Doane, p. 68)	1.25	6.92
Prepubescents changing to postpubescents (Doane, p. 68)	1.35	8.52
Pubescents (Doane, p. 59)	1.35	8.38
Pubescents changing to postpubescents (Doane, p. 62)	1.25	7.82
Postpubescents (Doane, p. 63)	1.04	6.6

There is a rapid increase in height and weight during the maturing period, with a gradual decline in rate after the maturing period.

The lung-capacity studies show similar gains due to the degree and rate of maturing. Examinations were made of 179 boys, with 57 of these carried over from 1910.

Lung capacity.

OCTOBER, 1910–MARCH, 1912; ONE YEAR FIVE MONTHS.

	Average gains 57 boys.		
	October, 1910.	March, 1912.	Differences.
	Cubic in.	*Cubic in.*	*Cubic in.*
Prepubescents (Deaver, p. 68)	125	136.6	+11.6
Prepubescents changing to pubescents (Deaver, p. 65)	145	177	+32
Pubescents changing to postpubescents (Deaver, p. 66)	141	181.1	+40.1
Pubescents changing to postpubescents (Deaver, p. 67)	173	218	+45

The following strength-test table gives the differences between groups:

Strength tests (grip), pounds.

	Forearms.				Shoulder retractors.	
	Right.	Difference.	Left.	Difference.		Difference.
Prepubescents	50.3–56.6	+ 6.3	42.3–49	+ 6.7	27.7–36.6	+ 8.9
Prepubescents changing to pubescents.	53.3–64.8	+11.5	49.9–56.8	+ 6.9	34.8–39.5	+ 4.7
Prepubescents changing to postpubescents	54.3–69.6	+15.3	52 –61	+ 9	34 –42.3	+ 8.3
Pubescents changing to postpubescents	73.6–88.8	+15.2	65 –85	+20	46.4–57.3	+ 10.9

The pubertal changes are more rapid in summer. With this change comes a more rapid increase in lung capacity and probably in height, weight, and strength. In lung capacity, e. g., if a boy changes from one period to another during the winter months, he will increase his lung capacity 10 to 14 cubic inches.

If he changes during the summer he will increase 20 to 28 cubic inches. It would be interesting to compare boys who spend their summers largely out of doors and those spending theirs indoors.

The heart rate and blood pressure studies have been continued for four years, 1908 to 1912. The following tables indicate the results of this study (Samson, p. 37):

Heart rate.

Year.	Prepubescents.		Pubescents.		Postpubescents.	
	Horizontal.	Vertical.	Horizontal.	Vertical.	Horizontal.	Vertical.
1908–9	77	84.8	70	75.5	67.5	83.2
1909–10	82.9	85.3	82.2	89.6	80.2	87
1910–11	80.9	90.7	83.1	94.1	81.4	92.6
1911–12:						
Tech	72.2	82.8	77.4	90.5	76.4	91.4
Cent	82.6	92	71.8	87.8	74.8	89.2

The examinations were conducted with great care. The location of the examining room reduced to a minimum the amount of exercise needed to get to the place for examination. Pupils were selected who had been seated in the classroom for at least an hour. Where there was any indication of accelerated heart action, from exercise or from nervousness, the pupil reclined for three or four minutes or until all evidence of acceleration had had time to disappear. The high heart rates which persisted were sometimes due to nervousness and sometimes to anemia or general low vitality. Variability was markedly greater in the pubescents and postpubescents, that is, during the period of rapid change. High heart rates seemed to indicate poor condition. Heart rates with wide variations between the horizontal and standing positions seem indicative of poor vascular adjustment.

In the Worcester group, the writer was fortunate in having several distinct types of boys to study.

(A) *Paper-route boys.*—These boys covered from 3 to 9 miles each day delivering papers, most of them before 7 a. m. They had lower heart rates than the average of their groups.

Heart rate of paper-route boys.

	Horizontal.	Standing.	General average.	
			Horizontal.	Standing.
P_1, P_2, P_3	63.5	75.2	68.6	84.7
P_3	60.7	71.3	65.9	82.1

The difference between the horizontal position and the standing position of the P_1, P_2, P_3 general-average boys was 16.1, of the paper-route boys it was 11.7. Of the P_3 general boys the difference was 16.2; of the paper-route boys, 10.6.

(B) *Athletic boys.*

	Horizontal.	Standing.	General average.	
			Horizontal.	Standing.
P_3	61.5	78.3	65.9	82.3

The difference in the general average was 16.2; of the athletic boys, 16.8.

(C) *Rapid growers.*—These boys grew in height from 1 to 3.1 centimeters in 10 weeks. They show the following relations to the other groups:

Heart rate over 80 beats per minute.

	Horizontal.	Standing.
	Per cent.	*Per cent.*
Rapid growers	30	90
Prepubescents	33	68
Pubescents	26	75
Postpubescents: All below 80	....	55

The rapid growers have, on the whole, the highest heart rate.

The systolic blood-pressure studies conformed to the same conditions as those for the heart rate mentioned above (Samson, p. 38):

Year.		Prepubescents.		Pubescents.		Postpubescents.	
		Horizontal.	Standing.	Horizontal.	Standing.	Horizontal.	Standing.
1908–9		103.6	104.3	110.5	110.8	110.3	109.5
1909–10		111.4	112.7	121.1	120.0	123.0	121.1
1910–11		110.9	111.2	120.5	117.8	126.1	125.4
1911–12	Tech.	106.0	107.7	106.6	108.7	110.2	111.06
	Cent.	106.6	110.3	109.2	116.7	116.3	122.4

The smallest range of difference is shown in the prepubescents. The pressure rises slightly in both the horizontal and vertical positions with the gradual maturing of the boy.

Low pressures (below 100) indicate a weak heart, weak peripheral resistance, or lack of splanchnic adjustment. The fall in pressure on changing from a horizontal to a standing position, probably means lack of cardio-vascular adjustment (vaso-motor tone). Low pressures (below 100) indicate lack of vigor. In high pressure (above 130), the examiner should find whether the kidneys are causing the high pressure. There is no evidence of an abrupt pubertal rise in blood pressure as stated by Hall[1] and Tyler.[2] With the wide blood pressure variations in prepubescents 78 to 120 millimeters Hg., in pubescents 78 to 152 millimeters Hg., in postpubescents 76 to 136 millimeters Hg., it seems necessary to conduct a series of experiments on the same boys for a series of years which shall follow their blood pressure changes through the entire period from immaturity to maturity. This summary represents four years of such study. The accumulation of data is slow, because a portion of the boys begin their maturing in the grammar school. This increases proportionately the number of pubescents and postpubescents in the high school.

The pressures of the prepubescents, pubescents, and postpubescents range over the same general field, with the tendency to the lowest pressures in the prepubescents, and the highest in the postpubescents. Experiments should be taken at intervals short enough to determine whether there is a rapid rise at any time, and, if such a rise occurs, whether it is in relation to pubescence.

Scholarship in relation to pubescence.

	Average grades.
Prepubescents, freshmen	75.1
Pubescents, freshmen	70.8
Postpubescents, freshmen	74.7

These average grades exclude the failures. The following table gives the percentage of failures in each subject:

Percentage of subjects failed in each period.

	Prepubescents.		Pubescents.		Postpubescents.	
	Number examined.	Per cent failed.	Number examined.	Per cent failed.	Number examined.	Per cent failed.
English	46	1.7	52	13.4	27	29.6
Mathematics	47	1.6	51	17.6	28	42.8
Science	29	0	23	13.4	28	12.5
History	46	0	50	12	28	0
Language	22	22.7	31	40	17	41.1
Total	190 (7)	3.6	207 (39)	19	128 (28)	22

	Total subject units.	Total failures.	Per cent failures.
Prepubescents	190	7	3.6
Pubescents	207	39	19
Postpubescents	128	28	22

Of those securing passing grades, the pubescents, or those maturing most rapidly, had the lowest grades. Among those who failed, there was a progressive increase in the number of subjects in which they failed. This was probably due to the duller boys being left behind, while the brighter boys were advanced to second-year work. The boys failed more often in English, mathematics, and language.

CONCLUSIONS.

The most obvious needs are for standards of growth and efficiency which are related to the maturity of the boy rather than to his chronological age. An illustration from Deaver's work will make clear in a graphic way the difference between chronological and physiological age in relation to strength and lung capacity. The table shows the increases for approximately the same period.

Differences between chronological and physiological age in regard to strength and lung capacity.

Chronological age.	Physiological age.	Right forearm.	Left forearm.	Shoulder retractors.	Lung capacity.
13 years 4 months	P_1	46	36	24	130
14 years 10 months	P_3	80	68	58	190
14 years 5 months	P_1	45	37	24	110
15 years 10 months	P_1	50	45	30	125

The younger boy is far ahead of the older boy in maturity and physical efficiency.

We have no accepted standards of growth and efficiency, nor can we have them until growth studies have been followed through with the same boys consecutively during the entire period of maturing.

We need at least the following standards:

1. Normal standards in height and weight which are related to maturity. Crampton[5] has shown that chronological age is not as good a basis for the study of height and weight as physiological age.

2. The work of the last four years has not completely disproved the commonly accepted pubertal rise in blood pressure, as stated by Hall[1] and Tyler.[2] It is fair to say, however, that the evidence points away from any abrupt pubertal rise. The nonappearance of the rise which one would expect to come with the rapid increase in heart size in relation to the size of the arteries is probably explained by the peripheral dilation of the small arteries, which keep down the pressure.

3. The present study points toward two conclusions in relation to scholarship:

(*a*) A lower grade in pubescent freshmen than in the prepubescent or postpubescent freshmen, for those who pass in their studies.

(*b*) With those who fail, there seems to be a progressive increase of failures from the prepubescents to the postpubescents, probably due to the leaving over of the pubescent and postpubescent failures from other years.

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THE ESTHESIOMETRIC METHOD, MEASURING FATIGUE, IN THE LIGHT OF THE LOGARITHMIC METHOD OF DR. AMÉLINE.[1]

Dr. M. C. Schuyten, Antwerp.

Those who are interested in the important problem of measurement of fatigue and followed the researches and debates on that matter, will still remember how the esthesiometric method was attacked and till what degree it is still the object of a coolness which his defenders were not able to combat. Now Dr. Ameline has found in my long esthesiometric determinations upon Antwerp school children[2] a logarithmic formula which was also applied to other biological phenomena. He comes to the conclusion that fatigue is a natural phenomenon only, and my overburdenings theory not based upon solid grounds.

To build up the known general logarithmic formula, Ameline takes a given group of results, for example, the group of backward children, right cheek, expressed in tenths of millimeters, and seeks in the plotted curve a maximum A which has, of course, a theoretical value only. He found here 280. Then he determines, by a series of subtractions (280 minus the successive values of fatigue), the mean mental energies during the successive months and a ratio to correct these rests, which are again subtracted from A and the results compared with the original experimental data. An example will illustrate the method:

Months.	October (No. 1).	November (No. 2).	December (No. 3).	January (No. 4).	February (No. 5).	March (No. 6).
E[a] (fatigue) found	147	170	187	195	213	225
280–E (mental energy)	133	110	93	85	67	55
280–E calc. (R=1, 183)	130	110	92,9	78,5	66,7	56
E calculated	150	170	187,1	201,5	213,7	224

[a] E or Écart, the distances between the points of the esthesiometer.

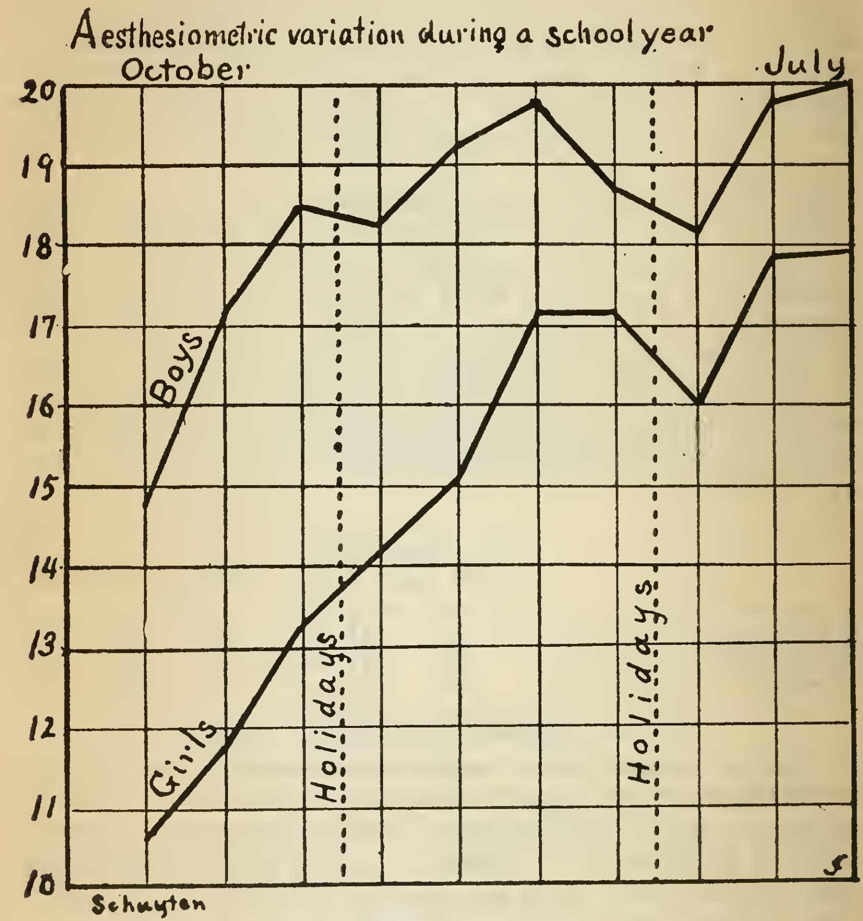
Giving up January, which might give, according to the holidays, an interruption in the regular development of the curve, the greatest difference found in the determined and calculated values is three-tenths of a millimeter. Therefore, it is sure that the geometrical series is established. In all my series the same result is mathematically obtained with regularity. The deductive equation is

$$0{,}168\ t = 5{,}033 - \log.\ \text{nep}\ (280 - E)$$

0,168 being the Neperian log. of the R=1,183; t the time (distances between the successive months), and 5,033 a constant which is the log. of A—E for the month 0 (September, not determined). It is only the general logarithmic formula

$$A - E = bc^{-et}$$

well known, in which e is the basis of the natural log. and A, b, and c to determine constants. The law is stated: The normal cerebral fatigue develops itself in a geometrical series, when the agreeing time is an arithemetical one. The conclusion is this: It is not possible to discover a mathematical law in a series of experiments when these are not accurately established, i. e., in nature exactly read; inversely a series of experiments are surely well executed when they conduct to a known mathematic law or formula. It is impossible to obtain that result if the employed method is not accurate. Thus the esthesiometric method is a valuable one for fatigue measurements. I conclude that the discussions about validity of esthesiometric results are closed. All the results obtained, tending to discredit the esthesiometer, are due to insufficient accuracy in the methods employed.



Now, my response to Ameline about his notion on overburdening. It will be very short, but conclusive enough, I think.

Acording to the views of this author, overburdening will be observed when on a given moment the logarithmic curve disappears and becomes an irregular line. The "natural" phenomenon can never be the expression of broken equilibrium. Overburdening here has thus the signification of pathologic state. And, if the general energy becomes slow and goes back, never mind—"la fonction fait l'organe." The different modified functions will draw up new appropriated organs. That is very true, but what is then the need for propagation of hygienic rules? Or, is it not better, necessarily, to modify all the organs in the way of better and more complete general transaction? I think yes! And each time I observe—for example with the esthesiometer, as I did, that fatigue, instead of disappearing during a school year, increases, with a ratio R as I found (see the figure), I conclude to overburdening, also when the organic state does not become pathologic in the sense of logarithmic calculation. And the degree of overburdening will depend on the value of the successive ordinates in the curve. If it is inevitable and natural that a given biological phenomenon, repeated in the same manner, becomes, during a variable long time, a horizontal line—theoretical, the ideal state—then it remains, however, always necessary to conduct it so that the reason R, in the case of mental fatigue in school children, is as small as possible.

I consider Ameline's mathematical work an important discovery, leading to a modified, more exact comprehension of mental school phenomena. It appeared in the psychological literature two years ago. Why did it not create more interest in the hygienic and pedagogic world? I can not explain!

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[1] Journ. de Psychol. norm. et pathol. 1911. (Alcan, Paris.)

[2] Paedologisch Jaarboek. 6, 1906–7. (Nederlandsche Boekhandel, Antwerpen.)

MORTALIDAD INFANTIL EN LA REPÚBLICA DEL URUGUAY EN EL DECENIO 1901-1910.

Dr. Julio A. Bauzá, director del Consultorio Gota de Leche No. 1.

CONSIDERACIONES GENERALES.

El Uruguay constituye un país cuya independencia data sólo de 80 años. Su poblición está constituída exclusivamente por descendientes de Europeos y alcanza á 1,250,000 habitantes, repartidos en una extensión territorial de 187,000 kilómetros cuadrados. De esta población, unos 350,000 habitan en Montevideo, estando el resto distribuído en los campos ó en ciudades de menor importancia. Por su situación geográfica entre los paralelos 30 y 35 de latitud sur y sus costas al Océano Atlántico y al Estuario del Plata, así como por

su topografía, su clima es benigno, observándose muy raramente que su temperatura baje de 0° en invierno ó suba de 30° ó 32° en verano, siendo su temperatura media en las distintas estaciones del año como sigue: En el quinquenio 1901–1905—verano, 21.5; otoño, 14.7; invierno, 11.6; primavera, 18.1. Promedio del quinquenio, 16.5. Siendo la inmensa mayoría de su población de origen latino, se comprende que sus costumbres son casi idénticas á las de los países europeos de la misma raza. La nupcialidad es de 7.59 por 1,000 en 1910, y la natalidad de 32 por 1,000 representa un coeficiente bastante alto, como puede verse observando la situación del Uruguay al lado de otros países.

Las mujeres han heredado de sus progenitores la sana costumbre, y la aptitud de criar á sus hijos á pecho, el mayor tiempo posible y esto no sólo se observa en la clase pobre, sino también en las clases elevadas. La moda europea de la alimentación artificial, por motivos de orden social, no ha entrado aún entre nosotros. No quiere decir esto que la alimentación artificial sea exepcional en los primeros meses de la vida, sino simplemente que no se encuentra tan generalizada como en los países europeos, como en Alemania y Francia; es posible darse cuenta del grado de extensión de la alimentación á pecho, en la clase pobre; observando el siguiente cuadro que se refiere á niños inscriptos en el Consultorio "Gota de Leche No. 1."

De 1,000 niños inscriptos en los años 1909 y 1910, encontramos que sólo 26 no tomaron nada de pecho. Por lo tanto el 97.4 por ciento de las madres inscriptas han podido ellas mismas amamantar mas ó menos tiempo total ó parcialmente á sus hijos; 54 de ellas sólo pudieron criar de varios días á un mes; es decir, que 920 sobre 1,000, ó sea 92 por ciento, han podido amamantar más de un mes á sus pequeños; 873 lo han hecho más de dos meses; 804 más de tres; 728 más de cuatro; 640 más de cinco; 567 más de siete meses. Es decir, que el 56.7 por ciento de las madres pobres han amamantado á sus hijos más de seis meses á pecho; 449 más de siete meses; 376 más de 8 meses; 314 más de 9 meses; 232 más de 10 meses. Más de 1 año sólo 119; esto es, 11.9 por ciento; 60 más de 14 meses; 26 más de 16, y sólo 3 más de 20 meses.

Como se vé, la aptitud de poder criar á sus hijos falta muy rara vez, y puede asegurarse que por lo menos el 92 por ciento de las madres pueden criar total ó parcialmente á pecho á sus hijos durante los 2 ó 3 primeros meses de la vida.

1.

LA MORTALIDAD INFANTIL EN RELACIÓN CON LA NATALIDAD, EN LA REPÚBLICA Y EN LOS DEPARTAMENTOS—ESTUDIO COMPARATIVO CON OTROS PAISES Y CIUDADES.

El alto coeficiente de natalidad, 32 por 1,000, que ofrece el Uruguay y un bajo cociente de mortalidad, 14.5, hacen que nuestro país tenga fama universal como sano, y que se haya mirado sino con indiferencia, por lo menos con poca atención, mucho de cuanto se relacione con el mejoramiento de la salud pública, que si no empeora, tampoco mejora como sucede hoy en casi todos los países civilizados, en los cuales se hacen toda clase de sacrificios para disminuir el coeficiente de mortalidad general y más especialmente el referente á la mortalidad infantil. Se dirá que entre nosotros no existe la cuestión de la mortalidad infantil, elevada en muchos países Europeos y Sud-Americanos. Pero nosotros probaremos con la elocuencia de las cifras que aunque no en tal alto grado como en Chile, Alemania, Austria, Rusia y Francia, existe entre nosotros dicho problema y merece dedicarle especial atención. Si bien tomando en conjunto los nacimientos 36,000 y las defunciones 3,600, resulta un coeficiente de 10 defunciones de menores de un año por 100 nacimientos, veremos en los cuadros siguientes las oscilaciones correspondientes á distintos años y sobre todo las diferencias que ofrecen los distintos Departamentos que constituyen la República.

Cuadro No. 1.

La mortalidad infantil (memores de 1 año) en toda la República, relacionada con la natalidad.

QUINQUENIO 1901-1905.

Años.	Nacimientos.	Defunciones.	Defunciones por 100 nacimientos.
1901	31,703	3,235	10.2
1902	31,526	3,358	10.6
1903	32,600	3,557	10.9
1904	26,984	2,398	8.9
1905	33,709	2,775	8.2

Promedio de defunciones (menores de 1 año) por 100 nacimientos, en 1901-1905, 9.7 por ciento.

QUINQUENIO 1906-1910.

Años.	Nacimientos.	Dfunciones.	Defunciones por 100 nacimientos.
1906	32,578	3,558	10.9
1907	33,657	3,662	10.8
1908	35,520	3,574	10
1909	35,663	3,583	10
1910	35,927	3,978	11

Promedio de defunciones (menores de 1 año) por 100 nacimientos, en 1906-1910, 10.6 por ciento.

Como puede verse, el coeficiente de mortalidad del Uruguay, que en el quinquenio 1901-1905, ofrece un promedio de 9.7 por 100 anual, en el período siguiente se eleva á 10.6 por 100; es decir, señala un aumento de 0.9 por 100, dando precisamente el año 1910 la cifra más elevada del decenio, 11 por 100.

Si separamos á Montevideo del resto del país y estudiamos comparativamente en los dos quinquenios, las cifras correspondientes á la capital y á la campaña, observaremos que mientras en Montevideo la mortalidad infantil media anual es casi la misma en los períodos 1901–1905 y 1906–1910, el promedio de cada período en la campaña demuestra un aumento de 1.3 por ciento, siendo los promedios, 9.3 en 1901–1905 y 10.6 en 1906–1910; manteniéndose, sin embargo, á una altura menor que en Montevideo. Los cuadros siguientes son bien ilustrativos al respecto:

Cuadro No. 2.

La mortalidad infantil en Montevideo, relacionada con la natalidad en el decenio 1901–1910.

A Años.	B Nacimientos.	C Defunciones de menores de 1 año.	$\frac{100c}{b}$ Defunciones por 100 nacimientos.
1901	7,824	963	12.
1902	7,834	931	11.8
1903	8,080	965	11.9
1904	7,702	737	9.5
1905	7,709	776	10.7
	39,149	4,372	11.2
1906	7,980	899	11.2
1907	8,356	887	10.6
1908	8,819	863	10.1
1909	9,363	1,009	10.7
1910	9,486	1,199	12.6
	44,004	4,857	11

Promedio de defunciones por 100 nacimientos, en el quinquenio 1901–1905, 11.2 por ciento.
Promedio de defunciones por 100 nacimientos, en el quinquenio 1906–1910, 11 por ciento.

Cuardo No. 3.

La mortalidad infantil en toda la República, excluido Montevideo, relacionada con la natalidad.

QUINQUENIO 1901–1905.

Año.	Nacimientos.	Defunciones de 0 á 1 año.	Defunciones por 100 nacimientos.
1901	23,879	2,272	9.5
1902	23,692	2,427	10.2
1903	24,520	2,592	10.5
1904	19,282	1,661	8.6
1905	26,000	1,999	7.6

Promedio del quinquenio 1901–1905, 9.3 por ciento.

La mortalidad infantil en toda la (República, excluído Montevideo, relacionada con la natalidad—Continúa.

QUINQUENIO 1906–1910.

Año.	Nacimientos.	Defunciones de 0 á 1 año.	Defunciones por 100 nacimientos.
1906	24,598	2,659	10.8
1907	23,301	2,775	10.9
1908	26,701	2,711	10.5
1909	26,300	2,574	9.7
1910	26,441	2,779	11.

Promedio del quinquenio 1909–1910, 10.6 por ciento.

Si observamos aisladamente cada uno de los Departamentos que constituyen la República, observaremos como puede verse en los mapas adjuntos, que en el quinquenio 1901–1906, Artigas es el Departamento que ofrece una mortalidad infantil más elevada, 15.8 por 100 nacimientos, casi el doble de la de Canelones, 8 por ciento. Al lado del primero y en orden decreciente siguen Salto, Soriano, Rivera, Tacuarembó, Cerro-Largo, Durazno, Paysandú, Flores, Montevideo, Río Negro, San José, Minas, Florida, Colonia, Maldonado, Treinta y Tres, Rocha y Canelones.

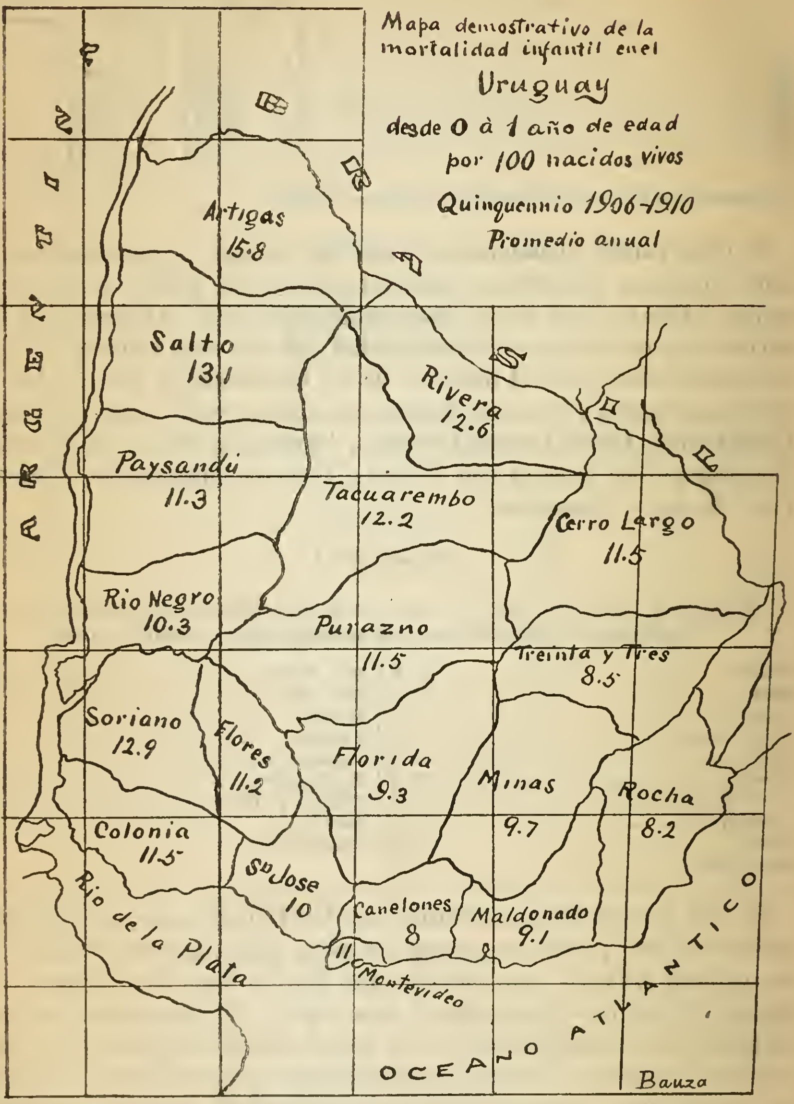
CUADRO No. 4.

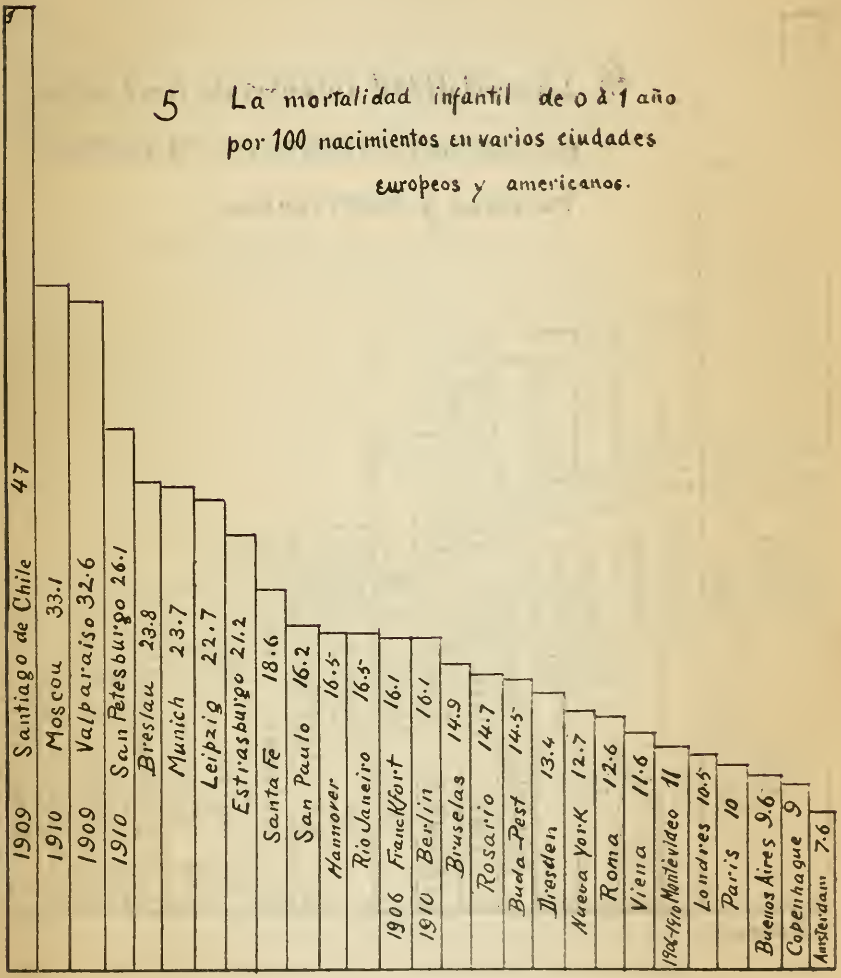
La mortalidad infantil desde 0 à 1 año en el Uruguay an les departamentos en el quinquenio 1906–1910, por 100 nacidos vivos (*Véase, p. 436*).

Artigas	15. 8
Salto	13. 1
Rivera	12. 6
Tacuarembo	12. 2
Soriano	12. 9
Durazno	11. 5
Cerro Largo	11. 5
Paysandu	11. 3
Flores	11. 2
Montevideo	11. 0
Rio Negro	10. 3
San Jose	10. 0
Minas	9. 7
Florida	9. 3
Colonia	9. 2
Maldonado	9. 1
Treinte y Tres	8. 5
Rocha	8. 2
Canelones	8. 0

Es casi general en esta nómina, que los Departamentos del Norte y que por tanto poseen un clima un poco más riguroso, tengan una mortalidad infantil más elevada que los del Sur; Río Negro entre los del Norte, hace excepción á esta regla. Si observamos ahora la situación de la República y la de Montevideo, comparándola con la de otros países y ciudades, observaremos que realmente ocupamos un puesto que es aún envidiable para infiinidad de países europeos y americanos.

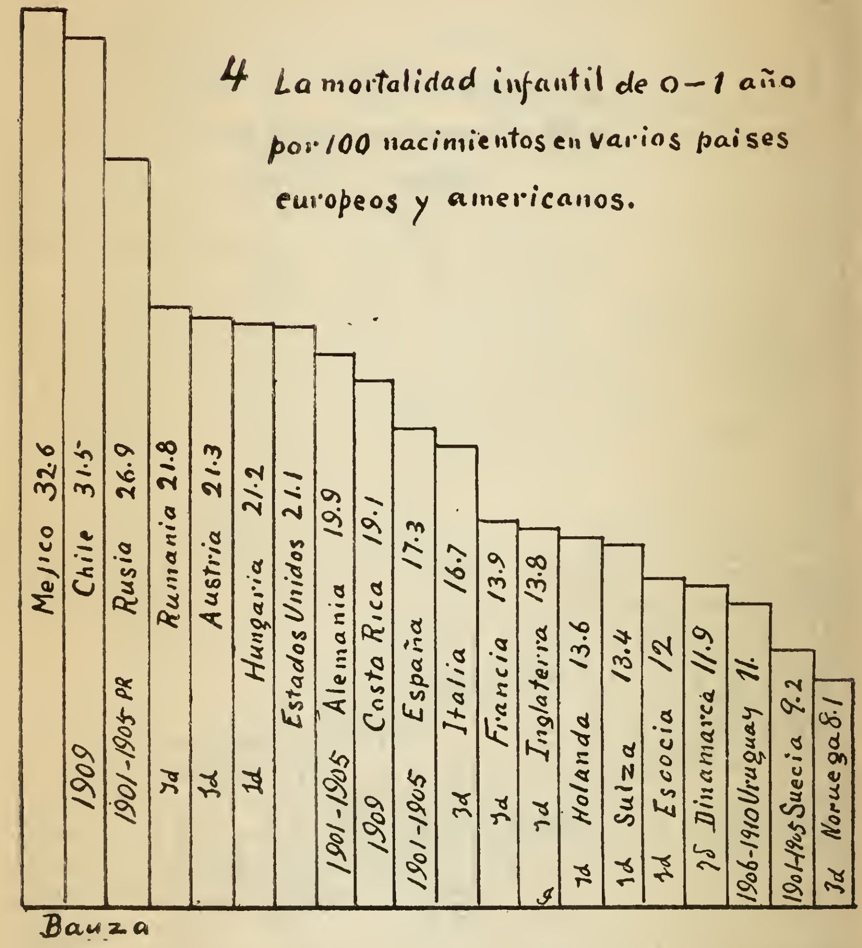
Los cuadros adjuntos expresan más fielmente nuestra condición de país de mortalidad infantil poco elevada.


Mapa demostrativo de la
mortalidad infantil en el
Uruguay
desde 0 à 1 año de edad
por 100 nacidos vivos
Quinquennio 1906-1910
Promedio anual
30
31
32
33
34
35
ARGENTINA
BRASIL
Artigas 15.8
Salto 13.1
Rivera 12.6
Paysandú 11.3
Tacuarembo 12.2
Cerro Largo 11.5
Rio Negro 10.3
Purazno 11.5
Treinta y Tres 8.5
Soriano 12.9
Flores 11.2
Florida 9.3
Minas 9.7
Rocha 8.2
Colonia 11.5
Sn Jose 10
Canelones 8
Maldonado 9.1
11 Montevideo
Rio de la Plata
OCEANO ATLANTICO
Bauza



5 La mortalidad infantil de 0 à 1 año por 100 nacimientos en varios ciudades europeos y americanos.

Bauza



4 La mortalidad infantil de 0–1 año por 100 nacimientos en varios paises europeos y americanos.

CUADRO No. 5.

La mortalidad infantil de 0 a 1 año relacionada con la natalidad en 28 ciudades (Véase, p. 437).

Santiago de Chile (1909)	47.0
Moscau (1910)	33.1
Valparaiso (1909)	32.6
S. Peterburgo (1910)	26.1
Breslau (1910)	23.8
Munich (1910)	23.7
Leipsig (1910)	22.7
Estrasburgo (1910)	21.2
Santa Fe (1910)	18.6
S. Paulo (1910)	16.7
Hannover (1910)	16.5
Rio Janeiro (1910)	16.5
Frankfort (1910)	16.1
Berlin (1910)	16.1
Bruselas (1910)	14.9
Rosario (1910)	14.7
Buda Pest (1910)	14.5
Dresde (1910)	13.4
Cassel (1910)	13.4
Nueva York (1910)	12.7
Roma (1910)	12.6
Montevideo (1910)	12.6
Viena (1910)	11.6
Londres (1910)	10.5
Paris (1910)	10.0
Buenos Aires (1910)	9.6
Copenhagen (1910)	9.0
Amsterdam (1910)	7.6

CUADRO No. 6.

La mortalidad infantil de 0 à 1 año per 100 nacimentos en los principales paises europeos y americanos (Véase, p. 438).

Mejico	32.6
Chile (1909)	31.5
Rusia (1901–1905)	26.9
Rumania (1901–1905)	21.8
Austria (1901–1905)	21.3
Hungary (1901–1905)	21.2
Estados Unidos	21.1
Alemania (1901–1905)	19.9
Costa Rica (1909)	19.1
Espana (1901–1905)	17.3
Italia (1901–1905)	16.7
Francia (1901–1905)	13.9
Inglaterra (1901–1905)	13.8
Holanda (1901–1905)	13.6
Suiza (1901–1905)	13.7
Escocia (1901–1905)	12.0
Dinamarca (1901–1905)	11.9
Uruguay (1906–1910)	11.0
Suecia (1901–1905)	9.2
Norvega	8.7

La mortalidad infantil tiende á elevarse en el Uruguay, al revés de lo que pasa en los países de Europa, en los que se nota un decrecimiento importante. Este aumento es mayor en la campaña, lo cual debe explicarse por la mayor ignorancia de las mujeres del campo, y por la alimentación artificial prematura y defectuosa.

En Montevideo observamos en el decenio 1901–1910, que el año 1907, año de larga guerra civil y de miseria, es el que ofrece el coeficiente menor de mortalidad infantil 9.5 por 100. Se reproduce el caso del sitio de París en 1871, durante el cual el número de fallecidos de menos de 1 año fué muy inferior al de los años precedentes. La explicación que se ha dado de este fenómeno curioso y que creemos también aplicable á Montevideo, es que cuando reina la escasez en la clase pobre, la alimentación natural á pecho se prolonga y la artificial se retarda, de lo cual fluye naturalmente que el niño está menos amenazado en su salud, se enferma más difícilmente y por tanto el número de defunciones debe disminuir.

El examen del cuadro 6 revela con toda nitidez la situación favorable del Uruguay en lo concerniente á la mortalidad de los menores de 1 año. De los 20 Estados mencionados, sólo 2 poseen un coeficiente de mortalidad infantil inferior á nuestro país; son Suecia y Noruega. Sin embargo tratándose de un país pequeño y totalmente civilizado, se comprende que todavía sería factible no sólo evitar el crecimiento de su mortalidad infantil, sino también disminuirla en 2 ó 3 unidades. Constituye un hecho digno de llamar la atención, que los países que poseen una natalidad mayor son en general los que presentan mortalidad infantil más crecida. La razón reside en las estrechas relaciones psicológicas existentes entre la mortalidad infantil y la natalidad. Donde nacen pocos niños, está en el interés de los padres extremar los cuidados para mantener la descendencia; y por el contrario, donde se produce una laguna, la descendencia está comprometida y por tanto existe el interés de llenar esa laguna. Natalidad grande produce mortalidad infantil elevada y mortalidad infantil exagerada, provoca como reacción, natalidad también elevada.

LA MORTALIDAD INFANTIL DE 0 Á 5 AÑOS.

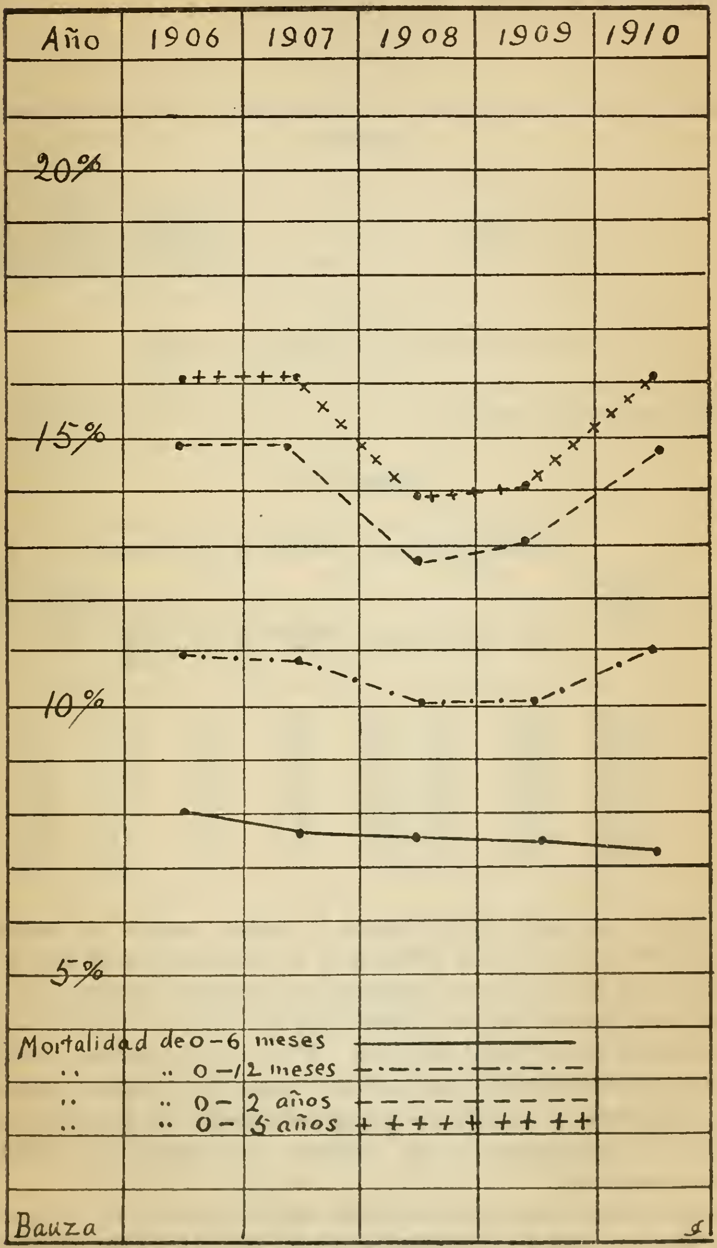
El paralelismo de las líneas que representan la mortalidad infantil se rompe en el año 1910 en la línea correspondiente á las defunciones de 0 á 1 año; mientras la mortalidad de 0 á 6 meses disminuye lentamente, desde 1906 á 1910, la línea que indica la mortalidad de 0 á 1 año, después de haber descendido ligeramente hasta 1909, se eleva en 1910, poniendo bien en evidencia que el aumento debe en este año referirse á niños de 6 meses á 1 año de edad. Esta elevación de la mortalidad existe también aunque en grado menor en los niños de 1 á 2 años y de 2 á 5 años, en el año indicado (Véase, p. 441).

No hay más que echar un golpe de vista sobre el cuadro No. 7, para apreciar que la mortalidad de 6 meses á 1 año en 1910 es de 3.9, la más alta del quinquenio. No cabe por tanto duda alguna que ese año fué funesto para los niños de esa edad, y ellos han sido los que han contribuído á aumentar la mortalidad infantil de ese año.

Comparando la mortalidad infantil antes del mes, relacionada con la natalidad en toda la República, con la que presentan otros países europeos, observaremos que le corresponde al Uruguay uno de los mejores puestos en la lista siguiente:

Baviera	8. 38
Austria	8. 26
Wurtemberg	7. 43
Sajonia	6. 39
Bulgaria (1902–1903)	5. 83
Prusia	5. 68
Francia	4. 89
Finlandia	4. 01
Dinamarca	3. 92
Uruguay (1906–1910)	3. 60
Holanda	3. 15
Suecia	3. 12
Noruega	2. 86

6. Grafica demostrativa de la mortalidad infantil de 0 á 5 años en el Uruguay (1906-1910), por 100 nacimientos.



Treintiseis defunciones de 0 á 1 mes por 1,000 nacimientos en el Uruguay, dicen bien elocuentemente que los peligros que amenazan al niño en el primer mes de la vida, no son tan pocos en nuestro país como en la mayor parte de los países europeos, siendo sólo aventajado por Holanda, Suecia y Noruega.

CUADRO No. 7.

Mortalidad infantil según la edad, en los menores de 1 año, relacionada con la natalidad.

Años.	Fallecen por 100 nacimientos, de 0 á 1 mes.	Fallecen por 100 nacimientos, desde 1 á 6 meses.	Fallecen por 100 nacimientos, desde 7 á 12 meses.
1906	3.6	4.3	3
1907	3.8	3.9	3.1
1908	3.6	4	2.4
1909	3.5	3.9	2.6
1910	3.5	3.6	3.9
Promedio del quinquenio 1906-1910	3.6	3.9	3

CUADRO No. 8.

Años.	Nacidos en toda la República.	Fallecidos menores de 2 años.			Fallecidos por 100 nacimientos.			Fallecidos de 2 á 5 años.	Promedio de fallecidos menores de 5 años, por 100 nacimientos.
		De 0 á 1 año.	De 1 á 2 años.	Total.	Menos de 1 año.	De 1 á 2 años.	Promedio de 0 á 2 años.		
1901	31,703	3,235	....	....	10.2	....	....	....	....
1902	31,526	3,358	746	4,104	10.6	2.3	12.9	367	14.1
1903	32,600	3,557	1,091	4,648	10.9	3.3	14.2	440	15.5
1904	26,984	2,398	870	3,268	8.9	3.2	12.1	432	13.7
1905	33,709	2,775	881	3,656	8.2	2.6	10.8	337	11.8
1906	32,578	3,558	1,270	4,828	10.9	3.9	14.8	445	16.1
1907	33,657	3,662	1,285	4,947	10.8	3.8	14.6	439	16
1908	35,520	3,574	971	4,545	10	2.7	12.7	336	13.7
1909	35,663	3,583	1,032	4,615	10	2.9	12.9	394	14
1910	35,927	3,978	1,299	5,277	11	3.6	14.6	454	15.9

Un punto de gran importancia á tratar cuando se estudie la natalidad de un país, es el referente á la ilegitimidad de los nacidos. Keller afirma que todo niño ilegítimo está constantemente en peligro; de modo que los países que tienen más nacimientos ilegítimos serán los de mortalidad infantil más alta. Esto, que tal vez sea verdadero para los países europeos; no es exacto para los países americanos y sobre todo para el nuestro en que generalmente los nacimientos ilegítimos son numerosos, y sin embargo la mortalidad infantil es bastante reducida.

De cualquier modo, es un punto negro en nuestra civilización, tener 26.6 por 100 de nacimientos ilegítimos, cifra sólo sobrepasada por Chile que tiene 35.

He aquí las cifras de algunos países europeos y americanos:

España	5. 5
Inglaterra	5. 2
Francia	7. 2
Italia	7. 7
Alemania	8. 7
Bélgica	7. 6
Austria	13. 1
Brasil	24. 3
Argentina	25. 2
Uruguay	26. 6
Chile	35

Si estudiamos ahora los nacimientos ilegítimos por ciudades, encontramos también para Montevideo una cifra bastante elevada.

Cuadro No. 9.

Nacimientos ilegítimos por 100 nacimientos.

Praga	43. 8
Estokolmo	31. 4
Viena	30
Budapest	27
Nancy	24
Moscou	21. 8
Coruña	21. 6
Breslau	21. 1
Río Janeiro	20. 6
Leipzig	20. 5
Montevideo	18. 8
Bukarest	18. 1
S. Petersburgo	17. 9
Santa Fé	16. 3
Bruselas	15. 8
Hamburgo	14. 6
Berlín	14. 7
Madrid	13. 5
Buenos Aires	12. 6
Rosario	10. 7
Milán	7. 1
Amsterdam	4. 3

LA MORTALIDAD INFANTIL, RELACIONADA CON LAS CAUSAS QUE LA PRODUCEN.

La República del Uruguay no posee, según hemos visto, comparando su mortalidad infantil con la de otros países Europeos y Sud-Americanos, un coeficiente elevado. Sin embargo, si se entra á estudiar las causas que producen la mortalidad de los menores de un año, se encuentra que podría reducirse esa mortalidad á cifras muy inferiores de las que presenta la actualidad. Tomemos, por ejemplo, la debilidad congénita.

Por debilidad congénita debe entenderse un estado de desarrollo insuficiente, que hace que las funciones vitales del recien nacido se cumplan con dificultad en condiciones normales, y no puedan continuar, y determinen la muerte, cuando sufren alteración sin que exista enfermedad. Por consiguiente, entran en este grupo los prematuros cuyo desarrollo es incompleto, y los niños que aunque nacidos de término poseen un peso muy inferior al normal, descendientes de padres enfermos ó con alguna tara que produzca la degeneración de los descendientes. El concepto debilidad congénita tiene pues importancia desde el punto de vista del estado de una raza, y puede decirse que es indicio de la vitalidad del país. De aquí que su estudio sea importante desde el punto de vista estadístico, como causa de muerte. Desgraciadamente, la estadística de la debilidad congénita ofrece numerosas lagunas. Es indudable que un cierto número de los inscriptos como nacidos muertos, han nacido con vida, para morir horas mas tarde, sin que sea así declarado al médico. Muchos confunden la debilidad congénita con la inaptitud para la vida, por un vicio de conformación; como, por ejemplo, labio-leporino completo, espina bífida, etc.; un niño así está ciertamente en inferioridad de condiciones y fácilmente adquirirá una enfermedad intestinal ó broncopulmonar aun cuando pueda no ser un débil congénito. Y en estos casos depende del médico si en la causa de la mortalidad la debilidad congénita se señalará como causa primitiva ó secundaria. Muchos niños débiles congénitos son, sifilíticos hereditarios y muchas veces por causa del origen de esta enfermedad, no se la daclara en la defunción y va con la etiqueta de debilidad congénita, aumentándose así la cifra verdadera.

En el estudio de las consideraciones precedentes, debe buscarse la explicación de las diferencias extraordinarias que se encuentran en diferentes ciudades. Del estudio practicado por Erös en 17 ciudades, se encuentra para Nápoles la cifra más baja, 0.95 por ciento nacimientos y Praga la más alta 10.7 por ciento. En Montevideo, de 1,000 nacidos con vida mueren en 1908, 12.3; en 1909, 12.8, y en 1910, 12.1, por debilidad congénita. En el resto de la República los datos son incompletos y es tan grande el número de las defunciones sin causa especificada, 30 por ciento ó más, que es imposible hacer estadística de valor.

Sería de desear que las autoridades á las cuales corresponda, tomen nota de este defecto y traten de subsanarlo en lo posible.

Si consideramos la debilidad congénita en relación á la mortalidad infantil total, tenemos que ella constituye aproximadamente el décimo; la cifra más alta del decenio corresponde al año 1903 con 16.9 por 100 fallecidos menores de 1 año, y la más baja 6 por ciento en el año 1906. Estos datos se refieren á Montevideo. El 25 por ciento aproximadamente de los fallecidos en el primer mes, es debido á la debilidad congénita. Estas cifras son bastante bajas si se relaciona con otras ciudades europeas, como Hamburgo, Frankfort, etc., que dan un coeficiente de 50 á 60 por ciento. Las causas que la producen son: La debilidad, el alcoholismo, la tuberculosis, la sífilis, el trabajo exagerado de la madre y la miseria á la mala alimentación. Es por tanto en este sentido que hay que orientar la profilaxia, estableciendo el seguro de las madres obreras y la protección de las embarazadas en el mes que precede al parto. En este sentido, Montevideo cuenta con un refugio de embarazadas, en el cual son admitidas las madres pobres en la época que precede al parto. Durante un tiempo, de 1 á 2 meses, son alimentadas y cuidadas y al mismo tiempo se les enseña á preparar las ropas que ha de usar el futuro bebé. Esta protección se extiende hasta después del parto, para las madres solteras á las cuales se les busca una colocación donde sean admitidas con el hijo.

ENFERMEDADES CONTAGIOSAS.

Las enfermedades contagiosas, tanto en nuestro país como en otros, no producen casi defunciones en los menores de 1 año. La difteria, la escarlatina, el sarampión, apenas se señalan. La tos convulsa, la tuberculosis y la sífilis, y especialmente estas dos últimas, ya comienzan á hacer más estragos. La tuberculosis en sus diferentes formas da un promedio que oscila entre 0.7 en 1902 y 2.6 en 1903 por 100 fallecidos menores de 1 año. Esta cifra es seguramente inferior á la normal, pues bien sabemos que pocas veces se hace el diagnóstico de tuberculosis en el niño chico. En cuanto á la sífilis, el coeficiente oscila entre 0.9 en 1909 y 3.8 por ciento en 1908.

Otras enfermedades contagiosas, como la viruela, pasan años sin que se registre una defunción. Sin embargo no debe dejar de señalarse que en la epidemia que se declaró en 1910, fallecieron en Montevideo 32 niños menores de 1 año en un total de 1,199 defunciones, esto es 2.7 por ciento. La institución de la vacunación obligatoria ya decretada por el Gobierno, evitará que se produzca entre nosotros la terrible mortalidad infantil por viruela que azotó á Santiago de Chile en 1909 y 1910.

El tétano constituye también una enfermedad á la cual le dedicamos en la necrología un cuadro aparte. Si bien la mortalidad que ofrece la estadística no es muy grande, creemos firmemente que debe ser mucho mayor y que debe entrar en buen número en el grupo de las enfermedades no especificadas ó mal definidas de la campaña. En Rumania mueren de tétano infantil más de 2,000 niños por año.

En Montevideo, el coeficiente oscila entre 5 en 1904 y 0.6 por ciento en 1910; como puede verse en el cuadro respectivo esta enfermedad disminuye y tiende á desaparecer como sucederá cuando toda parturienta esté bien asistida. En el año 1910 se produjeron en Montevideo 7 defunciones por tétano infantil. En campaña, donde la asistencia deja aún bastante que desear, pasa otra cosa. En el Departamento de Tacuarembó, cuya población es un décimo de la de Montevideo, se producen sin embargo 9 defunciones por esta causa.

Convulsiones.—Otro importante grupo en la necrología infantil lo constituyen las convulsiones ó eclampsía infantil. Por cada 100 defunciones de menos de 1 año se producen de 5 á 6 por esta causa ó 0.5 por 1,000 nacimientos. Esta cifra no puede corresponder á todos los casos, pues muchas convulsiones son sólo un síntoma, sea de una afección meningea ó de una gastroenteritis. Por este motivo, una comparación es en este sentido de un valor muy problemático. De cualquier modo, comparando las estadísticas, puede afirmarse que la mortalidad por convulsiones es en Montevideo 20 ó 30 veces más baja que en gran número de ciudades europeas.

Meningitis.—La meningitis es en su inmensa mayoría de los casos, una enfermedad secundaria, vale decir una complicación, y la terminación bastante habitual de las broncopneumonia y de las gastroenteritis. Otras veces es un niño que muere por convulsiones de causa desconocida y que se clasifica de meningitis. Sería de desear que en todos los casos en los que la meningitis es la causa de la muerte, no se olvidase de colocar la afección primitiva, que es la que realmente debe figurar en la estadística. Es para mí indiscutible que un buen número de casos de meningitis son gastroenteritis ó broncopneumonia disimulados.

Si tomamos la cifra que la estadística ofrece, encontramos que por 100 niños fallecidos menores de 1 año, 10 son por meningitis aguda.

Enfermedades del aparato respiratorio.—Las enfermedades del aparato respiratorio, bronquitis, neumonía, y bronconeumonía forman entre nosotros un cociente elevado en la mortalidad infantil. En efecto, del examen del cuadro No. 10, se deduce que el 25 por ciento de las defunciones en niños menores de 1 año se producen debido á afecciones bronco-pulmonares, oscilando esta cifra entre 20 en 1905 y 26.5 en 1901 y 26 en 1910. Por 1,000 niños nacidos vivos mueren 26 por afecciones bronco-pulmonares antes del año en Montevideo.

La explicación de esta cifra tan elevada, casi igual á la que ofrecen ciudades cuyo clima es mucho más frío que el nuestro, como Berlín con 27 por 1,000 en 1901 y Hamburgo 29.39 en 1896, no debe buscarse sino en las condiciones climatológicas y sociales de cada ciudad. El clima de Montevideo es poco frío, y húmedo en invierno y ofrece grandes oscilaciones de temperatura en un mismo día, de manera que se facilita la producción de las enfermendades de las vías aéreas. Pero es indudable que no es este el principal factor, sino que creo más importante las deplorables condiciones en que vive el proletariado, en su mayor parte en viviendas frías, obscuras y húmedas. No de otra manera puede explicarse como Santiago de Chile, con un clima muy semejante al de Montevideo, ofrece cifras aterradoras, 37 por ciento de defunciones de menores de 1 año y 155 por 1,000 nacidos vivos en 1909.

No creemos que pueda darse otra explicación de esta catástrofe, que la miseria reinante entre la clase pobre. La profilaxia de este mal, estaría en la construcción de casas higiénicas para obreros y en la supresión de las miserables covachas que aun sirven de habitación á muchas familias obreras.

No debemos dejar de señalar que en el número de niños fallecidos por afecciones bronco-pulmonares, deben existir en cifra no pequeña, aquellos en los cuales la broncopneumonía aparece como complicación generalmente de una gastroenteritis aguda. Si se observa la gráfica de la mortalidad, puede verse que al descenso máximo que se produce en el mes de junio, sigue un ascenso en julio y agosto, que se debe especialmente á las enfermedades del aparato respiratorio, siguiendo en setiembre un nuevo descenso, seguido de ascenso continuado en octubre, noviembre y diciembre, que so debe á las enfermedades gastrointestinales.

ENFERMEDADES GASTRO-INTESTINALES.

Montevideo es una ciudad en la que la patología infantil domina la gastro-enteritis, como en la mayor parte de las ciudades. El verano dura, puede decirse que desde noviembre hasta marzo, es decir más ó menos cinco meses. La temperatura llega á límites bastante extremos, pasando muchas veces de 30° C. y llegando algunas veces aunque no persista hasta 38° C. á la sombra. Se comprende por tanto que la gastro-enteritis se observe en todas sus formas desde las atenuadas hasta las fulminantes, verdaderos coup de chaleur, caracterizados por diarrea, vómitos, fiebre, convulsiones y muerte rápida. En la etiología de la gastro-enteritis del verano, además de la acción directa de la temperatura sobre el niño, sobre todo si no es alimentado á pecho, disminuyendo su resistencia y su tolerancia por la leche y exaltando la virulencia de las bacterias del tubo intestinal, no debe olvidarse la acción de la sequedad del aire, que aumenta la evaporación y por tanto hace que el niño se defienda de la temperatura elevada por una exageración en la sed, que se traduce casi siempre en una sobre alimentación perjudicial.

También debe señalarse la acción altamente nociva de la temperatura sobre la leche que se emplea en la alimentación mixta ó artificial de los pequeños, leche que viene por ferrocarril y que se expende al consumidor 6, 8 ó 10 horas después de ordeñada, cuando los gérmenes se han multiplicado por millones. Es indudable que una leche que está trasformada en caldo de cultura, aun cuando sea servida no debe considerarse como inofensiva. Todas estas consideraciones tienden á explicar el coeficiente elevado que ofrece la estadística de la mortalidad por diarrea y enteritis.

El 28 por ciento de las defunciones antes del año, son debidos á la gastro-enteritis. Las cifras oscilan entre 22 en 1902 y 30 en 1910 por ciento. Por 1,000 nacidos vivos mueren 29 antes del año por gastro-enteritis. En Berlín mueren 79 por 1,000, como promedio anual desde 1901 á 1905. En Estados Unidos fallecen 40.3 por ciento de menos de 1 año por afecciones gastro-intestinales.

Enfermedades varias.—Con esta denominación van comprendidas otras enfermedades no mencionadas por separado, entre las cuales debe citarse el sarampión, la difteria, la escarlatina, la viruela, la erisípela, que forman aisladamente un cociente insignificante y por lo cual no figuran en las gráficas adjuntas. Los vicios de conformación congénita van incluídos en este grupo, formando más de la mitad del coeficiente indicado en las gráficas que es como término medio de 17 por ciento de defunciones de menores de 1 año.

Cuadro No. 10.

Mortalidad infantil en Montevideo desde 1901 á 1910.

Año.	Debilidad congénita.	Sífilis.	Tuberculosis.	Convulsiones.	Meningitis.	Tétano.	Enfermedades broncho-pulmonares.	Enfermedades gastro-intestinales.	Otras enfermedades.	Total.
1901	150	30	14	32	87	25	253	275	97	963
1902	157	33	7	40	81	34	241	205	133	931
1903	163	34	25	50	94	33	196	260	120	965
1904	69	21	10	29	97	37	162	178	134	737
1905	69	31	12	47	78	26	155	173	175	776
Total en el quinquenio	608	149	68	198	437	155	1,007	1,091	659	4,372
1906	55	26	17	44	106	40	235	222	154	899
1907	74	29	17	60	90	33	184	255	145	887
1908	109	33	13	51	71	17	191	233	145	863
1909	120	9	8	56	110	26	226	265	189	1,009
1910	113	15	9	65	127	7	312	352	199	1,199
Total en el quinquenio	471	112	64	276	504	123	1,148	1,327	832	4,857

Cuadro No. 11.

Causas de las defunciones en Montevideo.

QUINQUENIO 1901-1905.

Año.	De 100 defunciones se producen por—								
	Tuberculosis.	Sífilis.	Meningitis.	Convulsiones.	Tétano.	Afecciones broncho-pulmonares.	Afecciones gastro-intestinales.	Debilidad congénita.	Otras enfermedades.
1901	1.4	3.1	9.1	3.3	2.5	26.5	28.5	15.5	10
1902	.7	3.5	8.7	4.3	3.6	25.8	22	16.8	14.6
1903	2.6	3.5	9.7	5.2	3.4	20.3	27	16.9	11.4
1904	1.3	2.8	13.1	3.9	5	22	24.1	8.7	19.1
1905	1.5	4	10	6	3.3	20	22.3	8.3	24.6

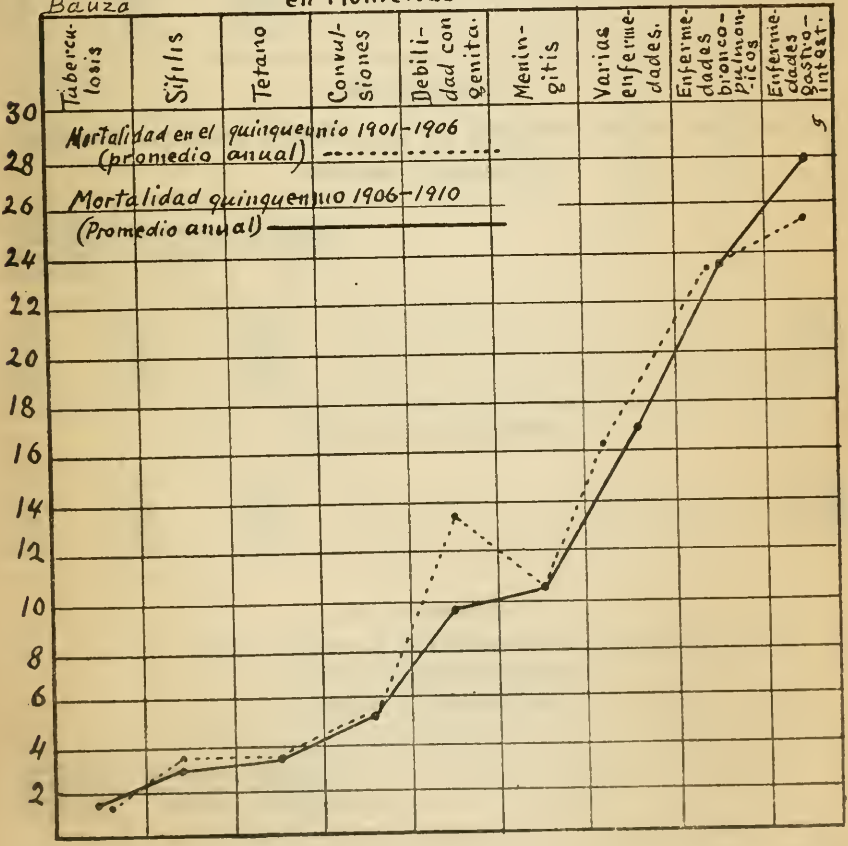
Causas de las defunciones en Montevideo—Continúa.

QUINQUENIO 1906-1910.

Año.	De 100 defunciones se producen por—								
	Tuberculosis.	Sífilis.	Meningitis.	Convulsiones.	Tétano.	Afecciones broncho-pulmonares.	Afecciones gastro-intestinales.	Debilidad congénita.	Otras enfermedades.
1906	1.9	2.9	11.9	4.9	4.4	26.22	24.6	6	17.20
1907	1.9	3.2	10.1	6.7	3.6	20.7	28.7	8.3	16.8
1908	1.5	3.8	8.2	5.9	2	22.1	28.2	12.6	15.7
1909	.8	.9	11	5.5	2.6	22.24	26.2	11.8	19
1910	.7	1.1	10.5	5.4	.6	26	30	9.4	16.30

12. Diagrama demostrativo de la mortalidad infantil en Montevideo.

Bauza



Cuadro No. 13.

La mortalidad infantil relacionada con la mortalidad general en toda la República.

QUINQUENIO 1901–1905.

Año.	Mortalidad en toda la República.	Mortalidad menores de 1 año.	Defunciones menores de 1 año, por 100 defunciones.
1901	12,504	3,235	25.8
1902	13,439	3,358	24.9
1903	13,673	3,557	26
1904	11,515	2,398	20.8
1905	13,612	2,775	20.4

QUINQUENIO 1906–1910.

1906	15,083	3,558	23.5
1907	15,561	3,662	23.5
1908	14,421	3,574	24.7
1909	15,249	3,583	23.5
1910	16,515	3,978	24

Cuadro No. 14.

La mortalidad infantil relacionada con la mortalidad general en Montevideo.

QUINQUENIO 1901–1905.

Año.	Mortalidad en Montevideo.	Mortalidad de menores de 1 año.	Defunciones menores de 1 año, por 100 defunciones.
1901	4,374	963	22
1902	4,466	931	20.8
1903	4,532	965	21.3
1904	4,639	737	15.9
1905	4,402	776	17.6

QUINQUENIO 1906–1910.

1906	5,042	899	17.8
1907	4,980	887	17.8
1908	4,822	863	17.7
1909	5,466	1,009	18.4
1910	6,162	1,199	19.4

Cuadro No. 15.

La mortalidad infantil relacionada con la mortalidad general en toda la República, excluído Montevideo.

QUINQUENIO 1901–1905.

Año.	Mortalidad en la República, excluído Montevideo.	Mortalidad de menores de 1 año.	Defunciones menores de 1 año, por 100 defunciones.
1901	8,130	2,272	27.9
1902	8,973	2,427	27
1903	9,141	2,592	28.3
1904	6,876	1,661	24.1
1905	9,210	2,000	21.7

La mortalidad infantil relacionada con la mortalidad general en toda la República, excluído Montevideo—Continúa.

QUINQUENIO 1906–1910.

Año.	Mortalidad en la República, excluído Montevideo.	Mortalidad de menores de 1 año.	Defunciones menores de 1 año, por 100 defunciones.
1906	10,041	2,660	26.4
1907	10,581	2,775	26.2
1908	9,599	2,691	28
1909	9,783	2,574	26.1
1910	10,453	2,779	26.6

La mortalidad infantil en los menores de 5 años, relacionada con la mortalidad general en varias ciudades. Por cada 1,000 defunciones se producen en:

Ciudades.	0 á 1 años.	0 á 2 años.	0 á 5 años.
Montevideo (1910)	194	272	295
Buenos Aires	206	281	340
Río Janeiro	223	304	372
Nueva York (1909)	228	....	....
Berlín	231	268	305
Breslau	270	304	335
Santa Fe	278	386	436
Rosario (República Argentina)	281	383	444
Sao Paulo	316	396	438
Santiago de Chile (1909)	380	442	481
Valparaíso (1909)	389	481	497
Mejico (1905)	278	....	....
Cairo	....	540	....

Como se ve, Montevideo es la ciudad más favorecida de todas las enunciadas, siguiéndole de cerca Buenos Aires, Valparaíso y Santiago de Chile, ciudades que poseen casi el mismo clima que Montevideo, presentan cifras dos veces más elevadas. El Cairo es la ciudad que da la cifra más alta. Por cada 1,000 defunciones, 540 se producen en niños menores de 2 años.

LA MORTALIDAD INFANTIL RELACIONADA CON LA MORTALIDAD GENERAL EN EL URUGUAY—ESTUDIO COMPARATIVO CON OTROS PAÍSES EUROPEOS Y AMERICANOS.

LA MORTALIDAD INFANTIL DE MONTEVIDEO RELACIONADA CON LA MORTALIDAD GENERAL.

Por cada 1,000 defunciones que se producen en el territorio de la República 240 corresponden á niños menores de 1 año, es decir, el cuarto de la general. Y si extendemos el plazo á los menores de 5 años, encontramos que por 1,000 defunciones 347, cifra del año 1910 y casi la más alta del quinquenio 1906–1910, corresponde á los menores de esta edad.

Chile que se caracteriza por su elevada mortalidad infantil, da un coeficiente de 50 por ciento de defunciones antes de los 5 años y de 38 por ciento antes de 1 año. Venezuela da un coeficiente de 37.3 por ciento antes de los cuatro años.

Si consideramos la mortalidad infantil en Montevideo relacionándola con la general, tenemos que oscila en el quinquenio 1905–1910 desde 17.7 en 1908 hasta 19.4 por ciento en 1910; mientras que si consideramos toda la República, descartada la Capital, la cifra se eleva á 26 y hasta 28 por ciento en 1910. La causa de esta diferencia no debe buscarse en la menor mortalidad infantil de la campaña con respecto á la Capital puesto que los cuadros y mapas publicados en otro lugar demuestran lo contrario, sino en la menor mortalidad general de la campaña con respecto á la Capital; pues por una parte la aglomeración de habitantes y por otra el hecho de que fallecen en la Capital muchos enfermos que vienen á ella desde el interior para asistirse, hacen elevar el coeficiente indicado. Si observamos el coeficiente de mortalidad infantil con respecto á la mortalidad general en varias ciudades, tenemos que por cada 1,000 defunciones se producen antes del año en—

	Defunciones.
Valparaíso, 1909	389
Santiago de Chile	380
Sao Paulo	316
Nueva York, 1908	228
Montevideo, Promedio, 1901–1905	182
Montevideo, 1910	194
Buenos Aires	206
Rosario	281
Rio Janeiro	223
Santa Fe	278
Berlín	231
Breslau	270

LA MORTINATALIDAD RELACIONADA CON LA NATALIDAD Y CON LA MORTALIDAD GENERAL.

El cuadro 14 pone bien de manifiesto que el número de nacidos sin vida, relacionado con los nacimientos, es sensiblemente constante á cada 100 nacidos con vida corresponden 4 nacidos muertos.

Esta cifra presenta lingeras oscilaciones, variando entre 3.7 en 1904 y 4.6 en 1906. La principal causa que produce la muerte en el momento de nacer, la constituyen los accidentes obstétricos y por tanto se comprende que la profilaxia consistirá en que los partos sean atendidos sólo por parteras diplomadas y en que éstas obtengan con el título que las habilita para ejercer, una preparación suficiente.

Es indudable que no debe ser esta causa más importante, por cuanto la cantidad de nacidos sin vida es mayor en Montevideo que en la campaña, aun cuando es de suponerse que en la Capital las parturientas deben ser mejor atendidas que en el norte del país. Tenemos en efecto en 1910 en Montevideo, 4.2 nacidos muertos por 100 nacimientos y en la campaña 3.4. Tal vez pueda explicarse este resultado contraditorio suponiendo que las cifras que arroja la estadística de la campaña sea inferior á la realidad. Es muy posible que en muchos casos de nacidos muertos, sobre todo teniendo en cuenta lo difícil que son las comunicaciones en cierta época del año en algunos Departamentos de nuestro país, que el hecho no se lleve á conocimiento de las autoridades y de este modo su número tal vez considerable no figure en la estadística. Si relacionamos ahora la mortinatalidad con la mortalidad general, tenemos que en Montevideo constituye el 6.8 por ciento de la mortalidad general y la República en el 7.91 por ciento.

He aquí algunas cifras correspondientes á algunas ciudades conocidas:

	Por ciento.
Milán	4. 4
Hamburgo	5. 1
San Petersburgo	5. 5
Berlín	5. 9
Leipzig	6. 58
Amsterdam	7. 5
Buenos Aires	9. 6
Trieste	10. 3
Río Janeiro	11. 5
Viena	12. 7

Como se ve, ocupamos una posición bastante satisfactoria en esta lista.

Cuadro No. 16.

La natalidad relacionada con la mortinatalidad en Montevideo en el decenio 1901–1910.

A. Años.	B. Nacimientos.	C. Nacidos muertos.	$\frac{100c}{b}$ Nacidos muertos por 100 nacimientos.
1901	7,824	343	4. 3
1902	7,834	353	4. 5
1903	8,080	327	4
1904	7,702	290	3. 7
1905	7,709	325	4. 2
1906	7,980	367	4. 6
1907	8,350	364	4. 3
1908	8,819	404	4. 5
1909	9,363	374	4
1910	9,486	406	4. 2

Promedio de nacidos muertos por 100 nacidos vivos: Quinquenio 1901–1905, 4.1; quinquenio 1906–1910, 4.3.

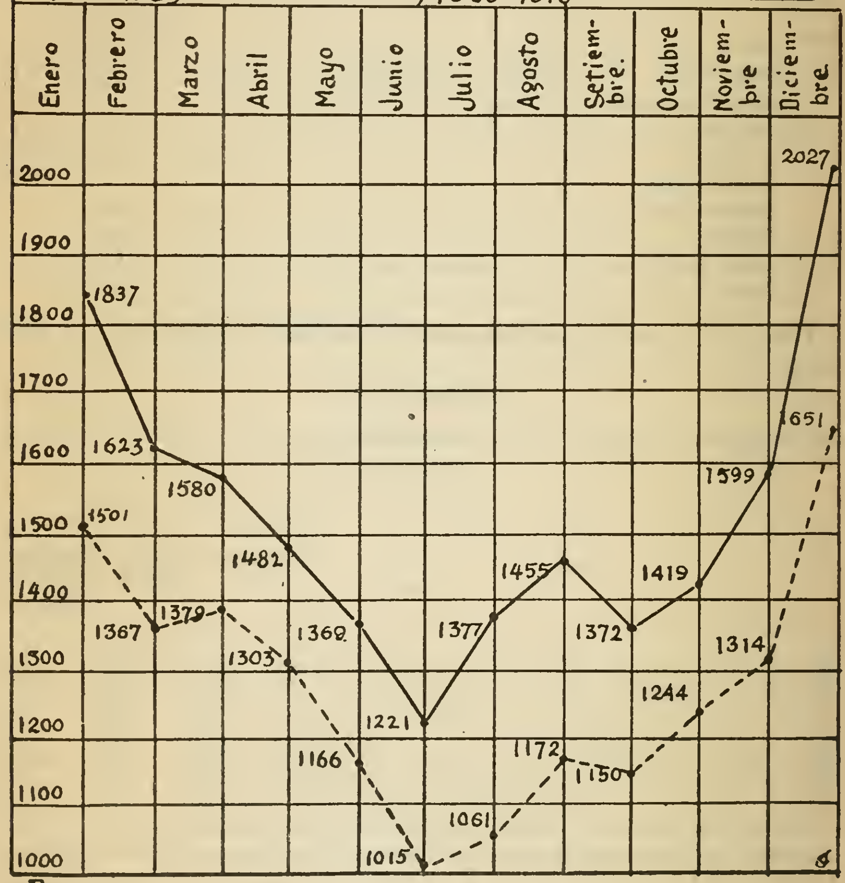
LA MORTALIDAD INFANTIL DE 0 Á 1 AÑO, EN LOS DIFERENTES MESES DEL AÑO, DURANTE EL DECENIO 1901–1910.

El estudio de las cifras que indican la cantidad de defunciones de los niños menores de 1 año, desde enero á diciembre, muestra claramente que la máxima corresponde á los meses de calor: Diciembre, enero, febrero y marzo y que la mínima á los meses de mayo, junio y julio.

Junio es el mes de mortalidad infantil más baja y diciembre el de la más crecida.

La mortalidad infantil en los meses que componen el año, en nuestro país, puede representarse con bastante precisión como una V, correspondiendo á los extremos superiores los meses de enero y diciembre, y al punto de unión inferior de los dos ramos de la V al mes de junio. Comparando las líneas de los dos quinquenios, vemos que son ambas bastante análogas, ofreciendo un paralelismo bastante aproximado en casi todos los meses, ofreciendo sin embargo algunas diferencias sensibles en los meses de marzo y setiembre. La mortalidad del mes de marzo en los cinco años transcurridos, desde 1901 á 1905, es algo inferior á la de febrero, mientras que durante el período 1906 á 1910 es ligeramente superior.

16. La mortalidad infantil (menores de 1 año) en la Republica del Uruguay, en los distintos meses del año, en los quinquennios: 1901–1905 ---------- y 1906–1910 ———



Bauza

Cuadro No. 17.

La mortalidad infantil de menores de 1 año á los distintos meses desde 1901 á 1910.

Año.	Enero.	Febrero.	Marzo.	Abril.	Mayo.	Junio.	Julio.	Agosto.	Septiembre.	Octubre.	Noviembre.	Diciembre.
1901 á 1905	1,501	1,367	1,379	1,303	1,166	1,015	1,061	1,172	1,150	1,244	1,314	1,651
1905 á 1910	1,837	1,623	1,580	1,482	1,369	1,221	1,373	1,455	1,372	1,419	1,599	2,027
Total	3,338	2,990	2,959	2,785	2,535	2,236	2,434	2,627	2,522	2,663	2,913	3,678

La mortalidad del mes de setiembre en el quinquenio 1901–1905 es inferior á la del mes de agosto, mientras que en el quinquenio 1906–1910 es inferior. En cuanto á la mortalidad del mes de diciembre, comparado en los dos quinquenios revela un aumento extraordinario y en desacuerdo con el aumento natural producido por la mayor natalidad en el quinquenio 1906–1910.

De aquí puede inferirse que la mortalidad por enfermedades de verano, gastro-enteritis ó análogas, tiende á elevarse considerablemente, y que la producida en los meses de invierno, enfermedades bronco-pulmonares, es sensiblemente la misma. En efecto, mientras la mortalidad de junio de 1906–1910 excede en un 20 por ciento á la de 1901–1905, la de diciembre le es superior en un 23 por ciento; es decir, que por 100 defunciones en el mes de junio desde 1901 á 1905 se producen 120 desde 1906 á 1910, aumento proporcionado al de la población, y por 100 defunciones producidas en diciembre en el quinquenio 1901–1905 se producen 123 en el quinquenio 1906–1910; el cual demuestra la consideración hecha algo más arriba.

NATALIDAD, MORTALIDAD GENERAL Y CRECIMIENTO VEGETATIVO DEL URUGUAY, COMPARADO CON OTROS PAÍSES (1908).

La República del Uruguay ocupa una posición intermedia entre los de natalidad más elevada y más baja. En efecto, entre Rusia con un coeficiente de 44.1 nacimientos por 1,000 habitantes y Francia con 20.2; el Uruguay con 32.4 ofrece el término medio casi exacto. De 23 países que figuran en la tabla que va á continuación, el Uruguay ocupa el 11 onceno puesto. Pero como su coeficiente de mortalidad general de 14.6 es el más reducido después de Noruega, resulta que su crecimiento vegetativo es de los más altos, 17.8 por 1,000, sobrepasado sólo por Bulgaria con 21.3 y algo superior al de la República Argentina que sigue inmediatamente con 17 por 1,000.

Por consiguiente no son los países de natalidad más elevada los que ofrecen un crecimiento vegetativo mayor; no hay más que leer las cifras correspondientes á Rumania y á Chile para ver que á pesar de su fuerte natalidad, ofrecen debido á mortalidad elevadísimas cifras de crecimiento vegetativo relativamente mínimo, pero que sin embargo es siempre de cierta importancia. En cambio los países de débil natalidad como Francia é Irlanda, por ejemplo, tienen un crecimiento casi nulo, 5.7 por 1,000 para Irlanda, 1.2 para Francia.

Si del estudio de los países pasamos al de las ciudades, observaremos el cuadro que sigue que de una lista de 33 ciudades conocidas por su importancia, Montevideo ocupa el duodécimo término en lo referente á la natalidad; es decir, que hay 11 ciudades de las mencionadas en la lista que poseen una natalidad mayor y hay 22 que tienen una mortalidad menor.

Su crecimiento vegetativo, siendo la diferencia entre 28.7 y 18.6 en 1910, fué de 10.1 por 1,000 habitantes, es sobrepasada por 13 ciudades de la lista.

No debe olvidarse sin embargo que la mortalidad general de 1910 fué extraordinariamente alta, teniendo en cuenta que en años anteriores el promedio era de 15 por 1,000.

En la lista que publicamos, observamos como el relativa á los países, que ciudades como Moscou y Valparaíso que poseen una fuerte natalidad, tienen también una mortalidad tan elevada que anula casi por completo á la primera, determinando un crecimiento vegetativo apenas apreciable, y que la ciudad de Santiago, Capital de la República de Chile, ofrece el particular, que se presta por cierto á muy tristes consideraciones, de que con una natalidad de 34.6 por 1,000, posea una mortalidad de 39.6 que excede por lo tanto en 5 unidades á la primera.

Es una ciudad por tanto que ofrece un decrecimiento vegetativo de 5 por 1,000.

No nos extrañará este dato, si consideramos la cifra aterradora de su mortalidad infantil.

De las ciudades que poseen una menor natalidad, no debe dejar de mencionarse París, Lion y Ginebra. En estas tres ciudades la mortalidad es casi igual natalidad, y por tanto su crecimiento vegetativo es sensiblemente igual á 0.

CUADRO No. 17.

Índice de natalidad, de mortalidad general y de crecimiento vegetativo en 1908, por 1,000 habitantes.

Paises.	Natalidad.	Mortalidad.	Crecimiento vegetativo.
Rusia	44.1	27.7	16.4
Costa Rica	43.1	....	....
Bulgaria	43.6	22.3	21.3
Rumanía	40.8	27.8	13
Chile	39.2	31.6	7.6
República Argentina	38	19	17
Hungría	36.3	24.8	11.5
Austria	33.8	22.6	11.2
Italia	33.4	22.6	10.8
España	33.2	23.3	9.9
Alemania	32	18	14
Uruguay	*32.4*	*14.6*	*17.8*
Holanda	29.7	15	14.7
Venezuela	31.1	25.1	6.03
Dinamarca	28.7	14.7	14
Escocia	27.2	16.1	11.1
Suiza	27	16.2	10.8
Inglaterra	26.5	14.7	11.8
Noruega	26.2	14.3	11.9
Brasil	26.1	19.3	6.8
Suecia	25.7	14.9	10.8
Irlanda	23.3	17.6	5.7
Francia	20.2	19	1.2

CUADRO No. 18.

Natalidad, mortalidad y crecimento vegetativo por 1,000 habitantes, en varias ciudades, en el año 1910.

	Natalidad.	Mortalidad.	Crecimiento vegetativo.
Rosario de Santa Fe	40.9	21.4	19.5
Valparaíso (1909)	40.1	34.2	5.9
Santa Fe	38.8	26.1	12.7
Moscou	35.3	29.5	5.8
Coruna	34.9	23.8	11.1
Santiago (1909)	34.6	39.6	....
Buenos Aires	34.2	16	18.2
Trieste	32.1	22.5	9.6
Bilbao	31.7	20.7	11
Bucarest	30.7	26	4.7
Liverpool	30	17.7	12.3
Montevideo	*28.7*	*18.6*	*10.1*
Dublin	28.3	21.1	7.2
Río Janeiro	27.8	20.6	7.2
Manchester	27	16	11
Nueva York	26.8	15.8	11
Nuremberg	26.7	14.8	11.9
Burmingham	26	13.6	12.4
Conpenhague	26	14.3	11.7
Bremen	26.1	14	12.1
Leipzig	24.2	13.7	10.5
Hamburgo	23.9	14.9	8.9
Roma	23	18.5	5
Stuttgart	23.2	14.1	9.1
Munich	22.9	16.2	6.7
Venecia	22.5	18.5	5
Milan	22.4	17.1	4.7
Viena	20.7	15.6	5.8
Amberes	20.2	12	8.2
París	18	16.7	1.3
Lion	17.4	17.7	0.37
Bruselas	11.8	13.6	3.1
Ginebra	14.9	13.3	1.6

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PROCEEDINGS OF A MEETING OF SUBSECTION ON MENTAL HYGIENE

HELD ON THURSDAY MORNING, SEPTEMBER 26, IN THE PAN AMERICAN UNION.

Chairman: Dr. LEWELLYS F. BARKER,
PROFESSOR OF INTERNAL MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD.
Secretary: Dr. GEORGE BLUMER,
DEAN OF THE MEDICAL SCHOOL, YALE UNIVERSITY, NEW HAVEN, CONN.

ACCOUNT OF THE PROCEEDINGS.

The Subsection on Mental Hygiene was called to order by the chairman, Dr. Lewellys F. Barker. Dr. Henry H. Goddard, of Vineland, N. J., read a paper on

The Prevention of Feeblemindedness.

The chairman made an address on

The Scope of Work of the National Committee for Mental Hygiene.

Participants in the discussion were Dr. M. P. E. Groszmann, Miss Maude E. Miner, and Mr. Bleecker Van Wagenen.

Dr. Thomas W. Salmon, of the United States Public Health Service spoke on

The Preventable Causes of Insanity. (No manuscript was furnished.)

Dr. L. Pierce Clark, of New York, read a paper entitled

Notes on the Prevention of Epilepsy.

Those who took part in the discussion were Dr. Eleanor S. Everhardt; Miss Maude E. Miner, of New York; Dr. M. P. E. Groszmann, of Plainfield, N. J.; Dr. J. E. Wallace Wallin, of Pittsburgh, Pa.; and Dr. Seelig, of Berlin, Germany.

Dr. Woods Hutchinson spoke on

Limitations and Fallacies in the Education of the Feebleminded. (No manuscript was furnished.)

THE PREVENTION OF FEEBLE-MINDEDNESS.

Dr. Henry H. Goddard, Vineland, N. J.

Formerly feeble-mindedness meant idiocy or imbecility, a condition bad enough, it is true, but not presenting the urgent need of control which we now feel comes from a better understanding of feeble-mindedness.

We have recently discovered that there are very many feeble-minded persons who are not recognized by the ordinary observer. They do not show any of the stigmata of degeneration, and are not found out until they have done something wrong. Even then their wrongdoing is more often attributed to willfulness than to inability to do right. Careful studies have shown that there is a group of people above the imbecile, but nevertheless truly feeble-minded, who are thoroughly irresponsible for the acts that they commit, "who can not compete on equal terms with their fellows, or manage their own affairs with ordinary prudence;" in short, are incapable of living an independent existence, but must always be dependent upon others. Not only has it been clearly demonstrated that there is such a group as this, but it has been shown that the number of them is vastly greater than anyone suspected.

It is a conservative statement to declare that 2 per cent of public-school children are distinctly feeble-minded, the larger part of them belonging to this high-grade group which we call morons. If a new disease were to appear and sweep away 2 per cent of our children, we would immediately set to work to prevent that disease. Here we have a condition affecting 2 per cent of the children, not, indeed, destroying their lives, but rendering them incapable of living with the rest of us on equal terms. Still more formidable is the fact that this condition is hereditary and directly transmitted from father or mother to child.

At least 65 per cent of all feeble-mindedness is hereditary. The low grade of intelligence which characterizes the feeble-minded can only result in their living shiftless, useless lives, spreading disease, because they are unintelligent in the matter of warding it off and avoiding it; and, lastly, in their breeding like animals. The Royal Commission of England found, upon investigation, that this type of person was increasing at twice the rate of the general population. A remarkable family investigated at the Vineland Training School, and described in a book recently published by the Macmillan Co., shows that six generations ago a man had two wives; the first was feeble-minded, and bore him a feeble-minded son; the second was a normal woman, and bore him six children. All of these, the feeble-minded son and six normal children, married and had children; the one, a line of mental defectives, and the others, of purely normal and respectable people. To-day the lineal descendants of the one feeble-minded son number 480, while the descendants of the six normal children of this marriage number 496. In other words, the feeble-minded branch of this family, starting from one ancestor, now numbers practically the same as the good branch, starting from six. It is easy to see that, unless feeble-mindedness is prevented, the feeble-minded people will in time outnumber the normal, and the burden will be greater than can possibly be borne.

But we do not have to look into the future to discover danger ahead. The feeble-minded person is a menace to society at the present moment. Many of our States are expending from one-fourth to one-half of the money raised in taxes on their defectives and delinquents, the pauper, the criminal, the prostitute, the drunkard, and the ne'er-do-well. And this amount takes no account of the cost of repairing the damage that is done by these persons, even in those cases where it can be repaired. Although we are lacking in those careful studies which give us exact statistics in all these lines, yet there is every reason to believe that from a quarter to a half of our criminals are feeble-minded. It is stated that a recent study of the inmates of the Elmira Reformatory, in New York, shows 65 per cent of them distinctly feeble-minded. Of the girls and boys in our reformatories, at least 25 per cent are feeble-minded.

Studies made for other purposes have, incidentally, shown that a very large proportion of drunkards are feeble-minded, and are drunkards because they are feeble-minded. Careful observation has convinced many workers that a large proportion of prostitutes are mentally defective and have easily been led into this life because of their natural impulses and their lack of intelligent control of them. Examination of the inmates of our almshouses will show that a large percentage of these also are mentally defective. In other words, if we could stop the creation of mentally defective persons in our society, we would reduce enormously our expenses in caring for our dependents. We put this on a financial basis, because here it can be estimated. No estimate can be made of the moral damage of the influence of these people in the community. If it is desirable to prevent feeble-mindedness in order to reduce the expenses of our commonwealth, it is much more desirable to prevent feeble-mindedness in order to save the moral contagion that results.

Our studies at Vineland have shown large communities honeycombed with mentally defective populations who are all related, all belonging to one or two degenerate defective families. Such conditions will be found all over the country in every State of the Union. How many of them, no one knows.

Feeble-mindedness must be prevented. How?

I shall not take up your time discussing how to prevent the 35 per cent of cases that are not hereditary, but are due to disease, to accidents, or something of that kind. These cases are more often of the lower type, and are usually cared for and live out their lives, and the matter is ended.

I shall confine myself to that far more dangerous and serious group of high-grade defectives who often pass for normal, and thus get placed in responsible positions where their failure to function properly results in great loss or damage or crime, and who at the same time marry and continue the race of defectives.

How shall we prevent this group of feeble-mindedness?

There are two solutions proposed: One is colonization; the other, sterilization.

Segregation through colonization appears to be the ideal method. It does not have any incidents or consequences that shock our sentiments or seem objectionable. These persons are picked out as early in life as possible, and removed to a large farm or institution, preferably in the country, where the sexes are kept apart. They are trained and educated in those things that they can learn, and, under the guidance and direction of more intelligent leaders, they are made more or less self-supporting. They live their lives in happiness and partial usefulness, and finally pass off the stage of action without having left any descendants to be cared for. It is estimated that, after a generation or two, our problem would be reduced to at least one-third of what it is at present. But the difficulty here lies in the fact that the situation has already gotten ahead of us.

One has only to estimate 2 per cent of the school population in any State to discover that it is practically impossible for us to finance the proposition of segregating and colonizing feeble-minded persons. But even if we arose to the occasion and raised the money necessary to provide for this, we would still be reckoning without our host. Many of these people are such high-grade defectives that the parents do not recognize the condition, and even if they do, will not consent to their being taken by the State and segregated for life. It does not seem likely that we will soon come to the point where society will forcibly take these children away from their parents and colonize them. Therefore, the permanent custodial care is not a feasible solution of the problem. We must go on colonizing and segregating as many as possible, doing what good we can in that way. But there is a large residue left over that must be provided for in some other way.

To help in the solution, sterilization has been proposed. This, as a rule, appeals to people as a quick and ready and easy solution of the difficulty, and many individuals apparently believe that if all of our States had sterilization laws the problem could be quickly solved. More experience and a deeper study of the situation reveals the fact that here again we are balked at many turns, and that the method is not adequate. Eight States now have laws allowing for the sterilization of certain persons under certain conditions. In all cases these are inmates of various State institutions for the feeble-minded and of our prisons and insane hospitals. The matter is in the charge of a commission who have power to go to the institution and demand the history and status of the various individuals and then authorize the operation on such as in their judgment are incurable and likely to transmit the condition to their children. It will be noted that, so far as the feeble-minded part of the problem is concerned, these are children already in institutions for the feeble-minded. What does their sterilization mean? It means that the institution can be a little less alert in keeping the sexes apart, and that a very small percentage who are capable (because they have been trained) of earning a living out of the institution may now be discharged and sent out to earn their own support, or sent home to parents who may now be trusted to take care of them, since they are sexually safe. Perhaps from 1 to 5 per cent of the inmates of our institutions might be thus be sent home and the burden of their expense removed from the State. In their places others will be taken into the institutions, some of whom can again be trained and sterilized and sent home. But unless care is taken in the selection of the cases this process will soon come to an end, and the institution will be filled with those who are untrainable or who can not be sent out, even if they are sterilized, and so nothing will be gained for society by the sterilization.

There is one way to utilize this law so as to make it of considerable importance toward solving the problem. Before discussing this we must consider some objections to the sterilization process, because, to make any wide use of it, it must be accepted as a satisfactory procedure.

The method of sterilization now generally advocated—and in some States the only one allowed by the law—is vasectomy or salpingectomy. This consists not in the removal of any organ, but in the severing of the essential tubes which convey the germ cells from the organs in which they are produced. These tubes once severed, the germ cells can not find their way to the proper place, and consequently can never unite for the production of offspring. The operation is simple and harmless and could even be performed without the subject knowing what had happened. There is no mutilation as in the older form of unsexing, which is so strongly objected to by many people.

On the other hand, the new form of sterilization has no other effect than to make procreation impossible. It does not remove the desire for sexual congress. On this account it is objected to by very many, who argue that if persons thus rendered incapable of procreation are turned loose in the community, they will become centers of debauchery and disease; that they will be sought out by persons who would otherwise remain virtuous, and thus will become dangerous elements in any community. In answer to this it may be said that the very meager data that is as yet available does not justify these fears. Secondly, it must be remembered that there would not be a large number of these in any community, and the few that there were could easily be controlled by an enlightened public. So far as disease is concerned, the matter could be put in the hands of the board of health and easily taken care of. So far as these persons themselves are concerned, they would undoubtedly be no more active than formerly, since these feeble-minded people never exercise any control under any conditions, and the removal of the fear of consequences would make no difference in them.

It seems highly probable that this objection is fanciful and not one that would prove serious in actual practice. If, then, we allow that the operation itself is satisfactory, our next problem is how shall we practice it under the law so as to make it most efficient toward the solution of this terrific problem of preventing feeble-mindedness. I say under the law, because it seems we must act under the present law and can hardly hope for a more drastic one. It is with considerable difficulty that even these laws have been obtained, and several States have rejected even them, so we can hardly hope for a time soon when we may have a law that will authorize some kind of a commission to sterilize any child that they deem feeble-minded, whether he is in an institution or not. But what we can do is to lay a definite plan whereby we may see to it that children from those families where this condition is demonstrated to be hereditary shall systemmatically be placed in institutions long enough for them to be operated upon and then allowed to go back to their homes. And thus, by definitely and consciously providing that there shall be a constant stream of defective persons going in, being sterilized, and sent out, we can, in a short time, have considerable effect upon the situation. In the light of our present knowledge of the problem and means of dealing with it, this seems to be the next step.

In those communities and among those people where such a procedure still seems unnecessary or undesirable, a campaign of education must be waged. It is only necessary for competent persons to make a reasonably careful investigation of conditions as they exist in almost any community and publish those results for the people to at once discover that here is a condition of things that must be stopped.

One or two other objections may be considered before closing this paper. In many cases it is thought that the law is unconstitutional. Perhaps I need here say nothing further on that subject than that the Supreme Court of the State of Washington has recently decided that the law is constitutional. This probably will go a long way toward determining the action of other States.

A less serious objection, but one that is sometimes heard, is that in thus stopping procreation in these families and cutting off the stream of defectives, we may be preventing the birth of geniuses, since genius is supposed to be somehow bound up with mental deficiency, in the sense that one child may be mentally defective and another one in the group a genius. If this were so, then one would need to ask the question, How many geniuses do we demand in order to compensate us for the horrible conditions that we are finding in these families that are feeble-minded and normal in the ratio of 4 to 1? But there is no evidence that such is the fact. In the investigations at Vineland of over 400 feeble-minded children and their ancestors, there has never yet been found a genius in any one of these families where heredity is the cause. If there is any foundation for this popular superstition, it is more likely to be in the connection between genius and insanity, but that has nothing to do with our present problem.

Finally, to those who still object to the proposal here made, there is only one answer. Let us study the problem from all standpoints. The writer is quite as willing as any objector to wait until we have further data on this problem before taking active steps; only let us proceed to study. Let us learn the facts, in order that we may deal wisely with this matter, which we now know is a serious problem.

THE SCOPE OF THE WORK OF THE NATIONAL COMMITTEE FOR MENTAL HYGIENE.

Lewellys F. Barker, M. D., President of the National Committee for Mental Hygiene, Baltimore.

It is right that, in an International Congress on Hygiene and Demography, the subject of mental hygiene should have especial representation. Though assigned, as a subsection, to the section on the hygiene of infancy and childhood, thus emphasizing its relations to inheritance on the one hand and to the early environmental period of the individual on the other, it might almost equally well, for other reasons, have been made a subdivision in any one of the main groups of the congress. Indeed, so important is this subject for the welfare of individuals, of families, of communities, of nations, and of the human race in general, and so widespread its ramifications, that committees on the organization of future congresses might well consider the establishment of an additional main section, devoted entirely to mental hygiene.

By a campaign for mental hygiene is meant a continuous effort directed toward conserving and improving the minds of the people; in other words, a systematic attempt to secure human brains, so naturally endowed and so nurtured that people will think better, feel better, and act better than they do now. Such a campaign was not to be expected before the rise of modern medicine. For only with this rise have we come to look upon states of mind as directly related to states of brain, to view insanity as disordered brain function, and to recognize in imbecility and in crime the evidences of brain defect. The imbecile, the hysterical, the epileptic, the insane, and the criminal were formerly regarded sometimes as saints or prophets, sometimes as wizards or witches, often as the victims of demoniac possession, on the one hand to be revered or worshiped, or on the other to be burned or otherwise tortured. Now, such unfortunates are looked upon as patients with disordered or defective nervous systems, proper subjects of medical care; some of them are curable; some are incurable, but still educable to social usefulness; a part of them are socially so worthless, harmful, or dangerous as to make their exclusion from general society necessary or desirable.[1]

It is but a short step from such a reformation of ideas to the realization that less-marked deviations from normal thought, feeling, or behavior are also evidences either of brains defective from the start or made abnormal in function by bad surroundings or by bodily disease. As examples of such less-marked abnormalities may be mentioned those met with in children who are difficult to educate, in young people arraigned in the juvenile courts, in adults who, inadequate to the strains of life, crowd our hospitals or sanitaria on account of "nervous" or "mental" breakdown, or who, owing to anomalies of character and conduct, provide material for the news columns of the sensational press. Modern medicine has taught us to recnize that the conditions necessary for a good mind include, first, the inheritance of such germ plasm from one's progenitors as will yield a brain capable of a high grade of development to individual and social usefulness, and, secondly, the protection of that brain from injury and the submission of it to influences favorable to the development of its powers. Now, if these doctrines of modern medicine be true, the general problems of mental hygiene become obvious;

broadly conceived, they consist, first, in providing for the birth of children endowed with good brains, denying, as far as possible, the privilege of parenthood to the manifestly unfit—that is to say, the problem of eugenics; and, second, in supplying all individuals, from the moment of fusion of the parental germ cells onward, and whether ancestrally well begun or not, with the environment best suited for the welfare of their mentality. The natural sciences are built up by the gradual discovery of causal relationships; and physicians and psychologists have, since the time of Pinel, gone far in the establishment of the laws underlying normal and abnormal phenomena of mind. From the conviction that a proper application of the facts already discovered can vastly improve the mental powers of our people, decreasing to a very large extent the prevalence of mental defect and mental disease, has come the impulse to arouse public opinion in favor of a definite plan for mental hygiene. This impulse, thanks to the initiative of a layman, Mr. C. W. Beers,[2] author of a Mind that Found Itself, whose personal sufferings led him, on recovery, to devote himself to the cause of mental hygiene, and who enlisted the cooperation of a group of representative medical men and social workers, has found expression in the voluntary formation of a national committee for mental hygiene. This committee was founded at a meeting held in New York City February 19, 1909, when the following officers were appointed for the first year: President, Dr. Henry B. Favill; vice presidents, Dr. Charles P. Bancroft and Dr. William H. Welch; executive committee, Dr. Adolf Meyer (chairman), Dr. C. P. Bancroft, Prof. Russell H. Chittenden, Prof. William James, and Miss Julia C. Lathrop.[3] Among its objects may be emphasized: (1) The protection of the mental health of the public at large; (2) the promotion of the study of mental disorders in all their forms and relations, and the dissemination of knowledge concerning their causes, treatment, and prevention; and (3) the amelioration of conditions among those already suffering from mental disorders.

As I see it, there are three great fields in which the national committee may advantageously labor.

First, there is the field of original inquiry regarding the problems of mental hygiene. A national committee, adequately endowed, could support and direct the investigation of special questions by experts, thus adding to the knowledge which can be applied in the more practical part of the campaign. This work of research is very costly. Were they available, immense sums could be used for studying the influences of heredity and of external circumstances upon the structure and functions of the human nervous system. Meanwhile a national committee composed of leaders of thought among the men and women of the country can do much to favor such studies by university departments, by existing institutes of research, and by other agencies already organized.

The second field includes the great work of educating the nation to use the knowledge which scientific investigators have already put at our disposal. In this field, three powerful enemies oppose us—ignorance, apathy, and prejudice. These hostile forces we must overcome. They will retreat, as they always do, before the attack of men and women armed with accurate knowledge of facts and energized by the emotions which accompany visions of remediable evil.

In this campaign of education the general public, physicians, school-teachers, the clergy, members of the legal profession, our legislators—all must be taught the particular truths regarding mental hygiene which each group, respectively, can best apply.

Only a minority of the public knows and realizes that the kind of mind an individual has depends upon the inborn qualities of brain he inherits and the influences which act upon it afterwards; that not only imbecility, insanity, and epilepsy are due to disordered or defective nervous systems, but that, further, inebriety, prostitution, vagrancy, pauperism, and crime have the same origin, as do also ineducability, laziness, and other forms of mental disability. Not many know that 40 to 50 per cent of all severer cases of mental disorder are due to known and well-defined causes, preventable by means with which we are now acquainted; that 25 per cent of the patients admitted to institutions for the insane, and a large proportion of the criminals in confinement have brains that have been injured by the abuse of alcohol; and that all general paresis and much mental disorder of other sorts has been preceded by syphilitic infection, usually insufficiently treated. Only a few are aware that there are already about 250,000 insane people in the United States to-day, and that the number is increasing at the rate of 3 or 4 per every 1,000 of increase of population. Not enough people realize that if two imbeciles marry all their children will be imbecile, or that when imbeciles marry normal persons about half the total offspring are feebleminded or degenerate. Nor as yet has it been possible to impress the public with the facts that the social stigmatizing of the insane is cruel and unreasonable; that suicide, occurring as a result of a psychopathic constitution, should excite the sympathy rather than the moral judgment of those who think humanely; that early treatment of insanity in suitable institutions leads to complete recovery in at least 25 per cent of the cases; or with a thousand other facts that ought to be known and realized.

How are the important data regarding the protection of the mental health of the public to be made available to them? This is one of the problems to be solved. Much can doubtless be done through the dissemination of suitable books and pamphlets, through sensible articles in magazines and newspapers, through public lectures, through "mental hygiene exhibits" such as the admirable one organized by the National Committee of Mental Hygiene under the supervision of Dr. Stewart Paton for this congress, through teaching in the schools, churches, and social clubs; most of all, however, through the advice of family physicians, who more than others have opportunity to be practically effective in giving wise counsel.

This brings me to the education of physicians. The instruction in psychiatry in our medical schools is sadly deficient. Though in Germany each university has for many years had its psychiatric clinic, it was not until recently that a single medical school in this country had a well-equipped clinic of this sort. Now the outlook is better. At Ann Arbor medical students have for several years had the privileges of a small clinic conducted along the newer lines. At Boston the new State psychopathic hospital will be available for educating students regarding the manifestations of mental disease. And lately, at the cost of over $1,000,000 given by Mr. Henry Phipps, a model psychiatric clinic has been erected in connection with the Johns Hopkins Hospital and University and its maintenance guaranteed for the coming decade. It can not be long now before every medical school of the first class will have its own psychiatric clinic. The teaching in these clinics will undoubtedly lead to great reforms in the treatment and in the prevention of mental diseases. The national committee may be of service in hastening the advent of such psychiatric clinics. It intends to keep on file all needed information regarding them, as well as plans of model clinics, sanitaria, hospitals, etc., which will be accessible to institutions or to community officials who may desire to consult them.

When physicians are better trained in psychiatry they will be even more helpful than now in counseling regarding the marriage of people with psychopathic tendencies concerning the hygiene of pregnancy, of birth, of childhood, of puberty, and of the climacteric period in relation to the education of backward or of peculiar children and with reference to dietetic, sexual, and occupational hygiene. They will also learn to recognize mental disorders earlier than now—that is, at a stage where many of them are curable—and will do much toward overcoming the prejudices of the people against referring the more serious cases to expert care in suitable institutions.[4]

The teachers in our schools and colleges should gladly join in a campaign for mental hygiene, and they themselves will welcome instruction which will help them in their pedagogic problems, for teachers have been among the first to notice among children great differences in degree of educability by ordinary methods. Until the reasons were made clear, some teachers unjustly blamed children slow to learn; other teachers, discouraged, unjustly blamed themselves. Here scientific medicine has come to the aid of pedagogy. School physicians are becoming more expert in distinguishing between inborn and acquired defect, between remediable and irremediable difficulty. The establishment of special classes and of special schools for "feebly endowed," "backward," and "exceptional" children is removing a great burden from the schools and the teachers. Special opportunities are being created, new methods are being devised, through which such children can be favorably influenced.

As to the need of education of the representatives of the law—lawyers, magistrates, judges, and legislators—anyone who has studied the psychology of criminals and who is at the same time familiar with our laws and our courts attests. Since psychiatrists have had the opportunity thoroughly to observe and study criminals before, during, and after punishment, our notions of the relations between crime and mental disorder (or anomaly) have been greatly changed. There is a growing tendency to recognize the dependence of criminal as well as of all other acts upon the mental state of the agent, and of the latter, in turn, upon the functions of his bodily organs. The newer knowledge demands a revision of the old problems of responsibility, of testamentary capacity, and of the nature and purpose of punishment. Above all, the new insight into facts can be valued for opposing and preventing crime. For since we no longer believe that every man at every moment is entirely free to act or not in a given way, but have come to realize that the behavior of a given moment may be a matter of necessity, we have begun to see that to prevent criminality we must bring influences to bear—social, economic, or medical—that will modify the mental factors driving individuals to antisocial acts. It will be a great step forward when all offenders brought before the juvenile court shall, after skilled psychiatric examination, be assigned to environments that will do most to educate them to social usefulness. Criminals, young or old, incapable of education to social value, society will learn permanently to exclude. That the scandal which has pertained to "expert" medical testimony in the courts must quickly disappear, once a real campaign of mental hygiene has made headway, goes without saying; and that in the revision of our law codes, particularly of its criminal code, specialists in psychiatry should cooperate with the best legal talent would seem obvious. Toward the spread of these ideas a national committee of mental hygiene should be able to do much.

Indispensable for accomplishment in the two fields already mentioned—those of investigation and of education—is activity in a third great field, that of organizing the agencies by which the campaign is to be carried on. The bulk of the work must be done by individuals and by local and State societies. An excellent beginning has been made by the State Charities Aid Association in New York and by the State Societies for Mental Hygiene, organized in Connecticut and in Illinois. To encourage the work of such associations, to stimulate the foundation of similar agencies in every State of the Union, and to coordinate and to give impetus to the work of the campaign throughout the whole country will be among the principal functions of the national committee. And while correlating the work of such agencies, the national committee will make every effort to cooperate with other national and international associations with allied philanthropic aims—eugenic, euthenic, pedagogic, sociologic, legislative. It will join in the general warfare against poverty and all the forms of social injustice which tend to unhinge the mind.

If the national committee for mental hygiene is successful in making of itself a strong central agency devoted to the objects mentioned, it will serve a function of fundamental importance to the whole American people. For if local communities remain backward in mental hygiene they must sooner or later injure more advanced distant communities. By keeping all the States informed of the plans of work adopted where progress is making fastest, advances can be made more rapidly, more uniformly, and more economically than would be otherwise possible. A representative national committee should be able to secure that nation-wide attention to the problems which is necessary for any steady advance toward those higher ideals of mental hygiene which we cherish. It is conceivable that Congress may be induced to supplement private funds in support of a movement of such national significance. It would be a good policy. Indeed it may in time become desirable to have the kind of work planned and begun by this voluntarily organized committee, conducted by a special bureau of the Federal Government. But we can scarcely expect this yet. Like many other forward movements in this Republic, the larger movement for mental hygiene must be initiated and be voluntarily supported by those who see the need and the opportunity long before the consciousness of the masses is aware of them.

To carry out its plan the national committee for mental hygiene will require large amounts of money. It would be hard to think of any project likely to yield larger returns, even in a material way, on money invested in it. The care of the insane of the Nation, together with the economic loss incurred through incapacity and death, were estimated by C. L. Dana,[5] in 1904, to be about $85,000,000 per year. If we add to this the expense borne by society because of the feeble or abnormal minds of criminals, inebriates, paupers, and social parasites generally we see what enormous sums could annually be saved by applying methods which will prevent mental anomaly and defect or which will restore working capacity and economic independence to those suffering from mental disorders.

It is hoped that the various phases of these problems will appeal to patriotic citizens who are well to do and who are willing to give of their surplus to better the minds of our people. To some philanthropists the endowment of original investigation will most appeal; to others, the support of educative measures; to still others, the defraying of the expenses of the work of organization. One gentleman, well known for his devotion to the public welfare, has contributed $50,000 to the committee for the "amelioration of the conditions of the insane," and this amount has made possible the special work of a "special committee on the survey and improvement of conditions among the insane."[6]

The work of ameliorating the conditions of the insane is very important, and the committee rejoices in a gift that permits a beginning in that direction. But its members hope that before very long large gifts may become available also for the very important matter of prevention. Sums of any size will be welcomed by the treasurer[7] of the national committee or by the chairman of the finance committee.[8]

The task which the national committee for mental hygiene has set itself is an enormous one. It hopes, by investigation, by education, and by organization steadily to improve the brain power of the Nation. It is striving to hasten the time when our people will be so begot and so reared that their minds will develop normally and harmoniously; when society will have less need than now for sanitoria, asylums, and prisons; and when all but an irreducible minority of those born to membership in the Nation may think, feel, and act in a way that will make them desirable citizens of that Better State which is our goal.

It is a great task, but surely not too great for the country that produced George Washington and John Marshall and Abraham Lincoln, or for the parents of a people to whom belong Benjamin Franklin and Willard Gibbes and Ralph Waldo Emerson.

DISCUSSION.

Dr. Maximilian P. E. Groszmann, Plainfield, N. J.: In commenting upon the excellent address of the chairman, I wish to emphasize his remark that the principal thing to consider is prevention. We understand that the only thing to do with the small group of children who are uneducable is to segregate them and place them under permanent institutional care. We must realize that they do not constitute a public-education problem at all, and that we must not shun the burden of dealing with them in the public school. But there is that much larger number of exceptional children who suffer from remediable and removable causes. There are economic handicaps; there are incurable diseases or other physical defects; there is maladjustment of educational systems and methods; there is a large number of causes which will make these children fall by the wayside and eventually suffer, mentally and morally, unless they are understood and cared for in time. We must therefore concentrate our attention upon helping those who can or must be helped, while we must be satisfied to develop provisions of segregation for those who can not be helped.

MAUDE E. MINER, secretary of New York Probation Association: Would not a resolution be in order from this section that the United States Government be urged to provide more adequately for mental as well as physical examination of immigrants under already existing laws?

I was told yesterday at the Bureau of Immigration that the lack of provision for sufficient numbers of physicians and interpreters is responsible for this.

BLEECKER VAN WAGENEN: Propaganda for eugenics and mental hygiene can well be promoted by personal presentation of these subjects by those who know the fundamental facts to those who do not know, in groups, or in personal conversation. The public interest is great and growing. Opportunities to tell abound. In speaking to audiences myself I have sometimes strung my remarks on these three words, "know," "care," "do." Open the mind to the wonderful and tremendous facts of life as they are now reported by the scientists and the research worker. Face these facts bravely and sympathetically until the heart responds with an eager desire for better conditions and cries out, "What can I do?" One thing all can do, even if they can do no more—tell others what they have learned. Thus a propaganda develops and grows of itself, and when millions of people are talking about one subject and demanding amelioration or prevention of existing conditions the necessary organizations and legislations are bound to come.

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[1] Cf. Stier (E.). Die Bedeutung der Psychiatrie für den Kulturfortschritt. Jena, 1911.

[2] Now secretary of the national committee.

[3] The chairman of the executive committee at present is Dr. George Blumer, of New Haven.

[4] Cf. Zingerle (H.). Die psychiatrischen Aufgaben des praktischen Arztes. Jena. 1911.

[5] See Dr. Dana's address before the Congress of Arts and Sciences, St. Louis, 1904.

[6] Of this committee Dr. William L. Russell is chairman, and through it the active services of Dr. Thomas W. Salmon, of the United States Marine and Public Health Service, and the aid of Mr. John Koren have been secured.

[7] Mr. Otto S. Bannard, of New York.

[8] Prof. Russel H. Chittenden, of New Haven.

NOTES ON THE PREVENTION OF EPILEPSY.

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If it be admitted, as some contend, that 20 per cent of epileptics have actually no bad ancestry (Gowers), no bad intrauterine or intrapartum history, or suffer infantile insults—in other words, absolutely nothing to explain the occurrence of their disease—then, of course, the influence of various heredity factors upon the procreation of epileptics must be essentially fallacious. The same argument holds true for idiocy and feeble-mindedness. If a perfectly sound child, as far as one may judge, develops epilepsy or idiocy without cause, then there can be no justification for the bold statement that some other child is epileptic or idiotic solely because his ancestry was bad—tubercular, alcoholic, or the like. In some of the careful English statistics there are more epileptics of sound stock than of alcoholic. One might argue therefrom that ancestral alcoholism gave some immunity, though, of course, the contention thus narrowed would be absurd.

The appearance of epilepsy in a family previously sound may be interpreted itself as a phenomenon of degeneracy, thus furnishing an illustration of the old doctrine that it is natural and unavoidable for a given stock to degenerate spontaneously. A society for the study of genealogy, heredity, and regeneration, recently organized in Germany, has announced that prosperity, mere improvement in material welfare, is alone sufficient to cause degeneracy. It is therefore possible that certain factors, commonly regarded as causes of degeneracy, are really effects of the latter. The effects then figure as further causes, and vicious circles result. From this point of view, epilepsy is greatly increased by civilization, which would make it very difficult, however imperative the need, to eradicate it by eugenics. Thus determinists would conclude that epilepsy and like disorders are invariably by-products of civilization.

Degeneracy must be understood in full to bring it into relationship with epilepsy. Its most common manifestations are expressed in low vitality (as seen in stillbirths, congenital debilty, inability of mothers to nurse, high infant mortality, falling birthrate, tuberculosis in early life), psychopathy, defective development in all phases, general inferiority, abnormal sexuality, criminal and other antisocial tendencies, pauperism, weak-mindedness, "genius," etc. In associating epilepsy here, one factor stands out prominently. The epileptic, like some other neuropaths, has in some respects great organic vigor, tenacity of life, etc. The idiopathic epileptic of sound stock, sound body, etc., represents a very high-class degenerate. The only part in him to suffer is the part which develops last—the cortex. From this type, as we descend in the scale, we find an increasing participation of the anatomical substratum, until gross defects like microcephalus appear. If these surmises are correct, idiopathic epilepsy in the sound would represent primary and practically nonpreventable degeneracy.

Convulsive phenomena referable to the cortex can not be isolated from other cortical phenomena. Whenever various cell elements are aggregated for the performance of various functions, disease of the structure is bound to follow several types. This is seen in skin pathology. If individuals apparently similar have the same kind of skin disease—simple eczema or dermatitis—one subject will show unusual activity of the pigment cells, another of the horny cells, etc. The first one will be left with a deep stain, while the second will show thickening of the horny layer, desquamation, etc. These differences are fundamental, and equally apparent in the cortex. Recently a typical case of epilepsy developed in a sound subject from an electric shock sufficient to kill. The man at once became a serial epileptic, with day and night attacks, and mental failure. Traumatic psychoneurosis and ordinary hysteria could be excluded. The case is believed to be the first on record. The usual result is death, or unconsciousness, followed at times by symptoms conformable to traumatic psychoneurosis. Just why a cortical insult produces epilepsy in one and not in others is unknowable. The practical deduction is that there is no logic in figuring on how to prevent epilepsy alone. But just what other conditions should be grouped with it is difficult to state. For the idiopathic type probably hysteria, psychasthenia, anomalies of character and personality, criminal and sexual degeneracy, and the insane in general, should be included. A mass study of all this material will doubtless bring much more prophylactic indications to light than a study of any one subject. No doubt such an inclusive study would show abundant evidence of primary degeneracy due to civilization.

A group of special interest from the viewpoint of prevention is the potential or latent epileptic of sound stock. His stock, however, is about due to degenerate from natural causes. He may receive a severe blow on the head or go through a severe febrile disease involving the cortex. He may become an epileptic, or may simply show arrested mental development, or may begin to show criminal or other degenerate tendencies. He is the familiar "black sheep" for a time, until others of the stock go wrong. It is, of course, a common thing for a "black sheep's" parents to charge his trouble to a blow on the head or a fever, and this explanation should be just in certain cases. Practically, there is no way of specially preventing blows, falls, and fevers, so here again we are up against the impossible.

In this connection it is impossible to state whether fright or affects alone can precipitate true epilepsy, since many believe one may isolate "affect epilepsy" from the true form. This affect epilepsy is, however, very rare. It is believed to occur only in degenerates. Other authorities do not regard all the convulsions of idiots as true epilepsy. They claim that the idiot has an infant's brain, which must be predisposed to eclampsia from reflex causes, such as infants often have.

That epileptics beget epileptics and all types of degenerates has been so well known since Echeverria's time that it requires no further demonstration. It is exactly what we should expect. The cortical convulsive anomaly would naturally be handed down with especial frequency because it is based on some structural peculiarity. Prophylactic data of the greatest significance come into play here. Epileptics must not marry. Especially they must not intermarry with epileptics or other degenerates. On rare occasions, certain epileptics may be allowed to marry sound mates, if they agree to lead perfectly regular lives, and if their children are brought up along certain strict lines. These exceptional cases may be open to criticism. Segregation in colonies naturally prevents procreation. Whether epileptics should be vasectomized, etc., must be decided in the future.

One-third of all idiopathic epileptics have an organic substratum, i. e., a gross anatomic alteration. This probably does not include any so-called focal cases, although it would take in "idiopathic" cases associated with focal lesions. In this one-third, we should expect to find mental defects, so that to prevent epilepsy in such cases would mean nothing. Preventions would apply to the causes of the anatomical alterations, which in some cases are very evident, even if not preventable. Among them would be the effects of birth traumatisms, which are preventable in part. The whole trend of modern obstetrics is toward the prevention of these accidents, and no doubt the management of obstetrics in the great medical centers prevents many cases of this sort, for every effort is made to secure the birth of an intact child. The vast majority of women throughout the world must be delivered by men of limited obstetric attainments and midwives. When the practice of obstetrics is carried on only by properly trained medical men, there should be a distinct reduction in the number of these cases.

"Prevention of epilepsy" finds an attractive field in maternal impressions scientifically interpreted, and in procreation under vicious circumstances. Maternal impressions should be operative only in the embryonal period of the fetus, say the first six or eight weeks of intrauterine life, and few are alleged to occur at this period. In fact, the woman may not know herself to be pregnant. We understand that if anything serious befalls the embryo or young fetus, it is much more likely to die outright and cause abortion than to sustain a radical arrest of development and live. Abortion itself is included among the common expressions of degeneracy. The tendency to-day is to explain most fatal anomalies, even those of apparent arrested development, by amniotic adhesions. The latter are not very well understood, but it seems just for the present to class them also with evidences of degeneracy. The fact that the cortex develops very late in intrauterine life and only in an imperfect degree would naturally suggest the possibility of accidents late in gestations. But not only is there commonly no history or evidence of such, but the inability to develop could be traced to an inherent insufficiency of the germ plasm. It is only recently that we have comprehended the great rôle of the ductless glands on growth and development. It is, of course, possible that errors in this field are dependent immediately on anomalous development of the thyroid, thymus, pancreas, hypophysis, etc.

A special type of maternal influence is seen when the mother has a severe toxemia or cachexia. One with typhoid or advanced tuberculosis will give birth to a small, puny, sickly child, possibly short-lived. But it is very doubtful if these children can be regarded as degenerates, or that they have any special predisposition to epilepsy or idiocy. The germ plasm is not affected or, as Forel would say, the children are not necessarily blastophthoric. It is claimed that women in advanced tuberculosis sometimes bear large, healthy, well-nourished children, but this could hardly occur with typhoid fever or any other acute febrile process. Much maternal invalidism seems to be without any influence on epilepsy in the child or on degeneracy in general.

Procreation when either parent is alcoholized, whether this is acute or chronic, affords a good example of transient blastophthoria in which the germ plasm is temporarily damaged. The condition is the very antithesis of degenerative blastophthoria, yet the result might be the same in procreation.

This subject may be followed up case by case, or by the statistical method of Bezzola, who found, among a presumably healthy people, that there were documents that more tainted subjects were procreated during periods of celebration and merrymaking than at the opposite periods. Bezzola worked out his method for idiocy only, and Klöpfel for microcephalus. More recently Müller applied it to epilepsy, and found that many more epileptics than idiots appear to answer this requirement. In the author's material it is expressly stated that alcoholism in the ascendants was four times as common as epilepsy. This is very different from the material of some countries. In England, presumably not a sober country, only 8 per cent of epileptics had alcoholic ancestors. In Switzerland (some places) epileptics and idiots are called Rauschkinder (jag children).

Blastophthoria appears to be a purely hypothetical entity. When a generation is skipped, as when a normal mother, daughter of an alcoholic, gives birth to a degenerate, we have to assume that blighted germ plasm can pass through a sound parent. If this is true, we can never be certain that a degenerate inherits directly from a degenerate parent, for both may be covictims and may have received the same blighted germ plasm from some one higher up. When the blastophthoric doctrine is contrasted with the "spontaneous" theory of degeneracy the latter seems to show up much stronger. From the Mendelian viewpoint the appearance of degenerates in a sound stock would resemble the appearance of new species. When sound and tainted individuals intermarry the progeny should comprise both sound and tainted individuals. If the germ plasm or fountain source is tainted, how can there be any sound individuals? In the 1,200 Jukes there was a very large per cent of healthy, normal subjects, good citizens. Eugenists would thus cut off good and bad alike and hence nominally should believe in blastophthoria.

The statement is sometimes made—dogmatically, as far as I know, but doubtless founded on statistics—that blood slightly tainted purifies itself in succeeding generations. Hence if a person in any way inferior marries into a sound stock the taint, if it is present at all in the progeny, soon disappears. In such a sound stock natural degeneracy would be remote. But if the stock were about to degenerate intermarriage with the tainted would precipitate it. This point would have to be taken into account in breeding. There should be tests for sound stock far removed from degeneracy—normal fertility, ability to suckle, normal vigor, freedom from abortions, menstrual irregularities, etc.—and a host of other requirements. If a man with a slight ancestral taint should marry it should be in such primitive stock. Degeneracy can hardly supervene all at once in a family. One generation ought to show a slight inferiority over its predecessor, such as could be readily demonstrated by applying standards. In human breeding approaching deterioration has always been recognized and attempts made to neutralize it by outside alliances.

It has been stated that 10 per cent of idiopathic epileptics undergo no mental deterioration from first to last. These must therefore differ radically from the 90 per cent who undergo mental failure. The latter test is used to differentiate epilepsy from hysteria, which of itself seems to indicate that such "benign" epilepsy must not be identical with the malignant form. Recoveries from epilepsy should belong to the benign type, but this need not follow, for cures could be effected, perhaps, before deterioration sets in. No special data in regard to causation and prophylaxis have been found for benign epilepsy. Gruhle terms this form of epilepsy "degenerative," the reason being obscure. He must mean that it is prima facie evidence of simple degeneracy.

According to Alzheimer, it is in epilepsy in those of sound stock that we are most likely to find constant lesions—sclerosis of the cornu of Ammon and marginal gliosis. This naturally suggests a special type of disease—a constant effect produced by the action of a single cause on a locality of least resistance. The single cause would have to be a bacterium or a toxin, with the chances much in favor of the latter. The toxin would be endogenous, of course, and could be explained by intestinal auto-intoxication, errors of metabolism, or disorders of the ductless glands. But if such a toxin could cause cortical lesions in the healthy, it should do so all the more readily in neuropathic subjects, syphilitics, the tuberculous, etc. These factors may therefore end by becoming mere accessories. The histological finds of Alzheimer are naturally not reckoned with the macroscopic lesions. Alzheimer says nearly all epileptics have a histological basis, while, as already stated, only one-third show macroscopic changes.

Therefore from this viewpoint we are justified in attempts to prevent the auto-intoxications. A survey of modern literature shows the predominance of the autotoxic theory in some form, even though one wishes to discount the significance of so-called auto-intoxication in an attempt to avoid a form of modern scientific cant; the material is very suggestive in metabolism study. Alexander, in England, believes firmly in the pernicious character of colonic putrefaction. Various resources for keeping the colon irrigated have had prompt and sustained good results in my hands. Lane, of England, performs ileosigmoidostomy; La Place, of France, and Alvès, of Peru, have performed appendicostomy and retrograde flushing. Doumer, of France, was so much impressed by results obtained in epilepsy in treating constipation with electricity that he reported the cases before the Academy of Sciences (Paris). Ebstein, in Germany, in a learned paper traced an intimate connection throughout the ages between gastro-intestinal disturbances and convulsive affections as a class. Epilepsy is no exception to this law, whatever its nature. Axtell, an American surgeon, has found over 30 cases of acute angulation and flexion of the sigmoid in epileptics causing mechanical obstruction. This all goes to suggest that in all possible candidates for epilepsy it is not enough simply to diet and evacuate the bowels. The whole colon should be examined, using all known resources. Many specialists recognize only mechanical causes of constipation. Let us suppose that in certain individuals certain substances are formed in the colon—powerful bodies like neurin and cholin. Like certain drugs, they have a selective affinity for particular cells. They are exquisitely neurotropic, like wood alcohol for the optic nerve, or the endotoxins of syphilis for the cortex and posterior cord. There are two ways of attacking this problem. First by diet—the future will soon see successful attempts to feed invalids exactly the nitrogenous compounds they require. Inert and toxic combinations will be left out. Second, less by "regulating the bowels" than by discovery and removal of mechanical obstacles. Possibly the ideas of driving putrefactive bacteria out of the intestine by introducing hostile germs may be made to cooperate.

Most unbiased authorities agree that if syphilis, tuberculosis, and alcohol cause epilepsy it is impossible to determine to what extent they operate and how they effect this result. But, in any case, abundant influences are at work to antagonize each one of these hostile agencies, so that nothing further can be done in behalf of epilepsy.

It is evident that prevention of epilepsy in the potential subject can not differ from the general hygiene of confirmed epilepsy. Among the "candidates for epilepsy" the "one-attack" subjects must be included, for they have not yet been proved to be epileptics. Other candidates must be judged by their inheritance in part, but Vogt finds that the majority of those who ought to be epileptics never become so—a strange inheritance irony. Despite their ancestry, they may be quite normal, or at most only a little nervous. It therefore would be a hardship to submit all these children to strict discipline. In crossed heredity the latter might be justifiable. As a rule, though, it would be best to wait for evidences of the epileptic character. It is an open question whether children with the spasmophilic constitution should be regarded as potentials. According to Birk, they represent two very different types. If there is a doubt, the child should be given the benefit of it. (See Vogt and Scholz.)

The epileptic character should be familiar to nurses, governesses, teachers, school physicians, etc. It is described at length by many writers upon this subject. One needs, however, to sharply distinguish between these characteristics, which belong to the preconvulsive make-up, and those really a part of the disease, or a sequelæ of the deterioration inseparable from the well-established convulsive disorder. When it has been decided that a child has the epileptic character, or rather characters—for there are different types—he is placed under a regimen (which must tend to a certain extent to irritate him). He should be disciplined, dieted, kept from exciting scenes (like moving pictures), for attacks, which would be certain to appear, may be precipitated or intensified by effects which in themselves may act as excitants.

From the foregoing remarks, one is made aware that the prevention of epilepsy is closely bound up with (1) a more precise and intensive study of family stock from which the disease is recruited, (2) birth injuries and accidents must be still further eliminated, (3) the rearing of neuropathic individuals must be given more definite and painstaking attention, and (4) proper metabolism in potentially epileptic individuals must be still more energetically safeguarded.

DISCUSSION.

Eleanora S. Everhard, M. D., Dayton, Ohio: In the noteworthy exhibit on mental hygiene I find the statement that healthy adjustment to environment depends upon, first, structural integrity of the nervous system; and, second, organization of sound habits. I have heard a great deal of discussion in regard to the first point; that is, upon insanity—feeble-mindedness—and the study of eugenics as a preventive measure, but I have heard very little discussion on the second point, namely, the organization of sound nerve habits.

In the same exhibit statistics given would seem to show that 250 insane per hundred thousand population is a high percentage. If it were possible to get statistics showing the number of individuals suffering from the popularly so-called functional neuroses, I suspect that we would find 250 per hundred thousand extremely low.

Realizing that the education of the individual begins in the cradle, and that the second step in education takes place in the public schools, it would seem that some provision for training in the organization of sound nerve habits should be found in the public schools.

We hear of school-teaching as a nerve-wrecking occupation, yet, when we consider the conditions under which the school-teacher labors, we find nothing in those conditions which need render teaching nerve wrecking, nor do I believe that it is so if the teacher understands anything whatever about the organization of sound nerve habits.

At the present time I have not sufficient data upon which to base a general statement which is scientifically accurate, but I have enough to assure me that those cases in my own practice who have been trained in nerve habits have ceased to find teaching nerve wrecking, and that they have borne in mind the organization of sound habits in the children under their charge.

If there were courses in mental hygiene in the normal schools, in which teachers might be taught in a practical way what is meant by sound habits and how they are to be organized, I believe that much would be done to prevent nerve instability and neuroses.

Maude E. Miner, secretary, New York Probation Association, New York City: Great effort should be made to secure mental examinations in our courts for the purpose of sifting out those who are mentally deficient and properly segregating them. Through dealing with girls in courts in New York City, where we find many who are mentally deficient, or by observing the work of Dr. Healy in the psychopathic clinic in Chicago, we see the necessity of such mental examinations.

I have found that many of the young girls who have entered prostitution, and for that reason come in conflict with the law, were not normal mentally, and were either feeble-minded, constitutionally inferior, or so-called border-line cases. In one case we discovered that a mentally deficient girl in prostitution had a feeble-minded mother who had given birth to 13 illegitimate children. That mother should have been cared for by the State in a custodial institution, and so prevented from procreating her kind. It would be a great financial saving to the State, as well as a more humane thing, to provide for such women rather than care for their offspring in courts and prisons.

We find that the mental examinations help in dealing with those who are not of the feeble-minded class, determining the training that they need, helping us to discover the occupation for which they are best fitted, or in deciding whether or not commitment to an institution is desirable. By closely studying the individual, providing suitable mental examination, and then by adequately segregating those in need of it, we shall take a real step forward in the prevention of feeble-mindedness, of prostitution, and of crime.

Maximilian P. E. Groszmann, Ph. D., Plainfield, N. J.: I approve of Dr. Clark's conservative statement in regard to the effect of alcoholism in the parents upon the production of imbecile children. It is significant that Dr. Rogers, who is at the head of a large State institution for the feeble-minded, also emphasized that we should be very cautious in assuming that alcoholism can be considered as a hereditary cause of mental deficiency in the offspring. I am inclined to agree fully with him that alcoholism should be considered rather as a symptom of a deeper constitutional defect. It is one of the evidences of degeneracy. This inherent weakness will produce inebriety in one generation or individual of a tainted family, while it may produce other mental or moral defects in other individuals, or lead to criminality, prostitution, pauperism, and general inefficiency in still others. It would appear, therefore, to be one of the forms in which a degenerate type manifests itself. In other words, it is, in all probability, not a cause but an effect. At any rate the last word on the problem of alcoholic heredity has not yet been spoken.

But, certainly, if it were true that inebriety in the ancestors is a hereditary cause of mental defect, all of us assembled here should by rights be in an institution for the feeble-minded. For the ancestors of nearly all of us, half a dozen generations back, were heavy drinkers and rarely went to bed without a good-sized nightcap. In particular, the Germans should be mental and moral defectives, for it is a well-known custom for mothers in Germany to drink beer during pregnancy and lactation, sometimes upon the direct advice of the physician. More especially Munich should be a city of degeneracy owing to the sad hereditary effects which the "Münchner Hofbräu" must have upon the mental condition of the community, according to the alarmists who claim that parents who indulge in wine or beer will have an imbecile offspring. And Munich has its American parallels in Milwaukee, Rochester, and Cincinnati, among others, where we ought to be prepared to find degenerate citizenship. As a matter of fact, however, the Germans are a virile nation of thinkers, artists, progressive merchants, and technical inventors of the first rank. Munich, in particular, is a city of academies, museums, and art galleries; and Milwaukee, Rochester, and Cincinnati are among the most progressive cities in the United States. If I am not mistaken, the President of this country is a citizen of Cincinnati.

Dr. J. E. Wallace Wallin, University of Pittsburgh: After having used the Binet-Simon graded tests of intelligence for several years on feeble-minded, epileptic, insane, and mentally retarded cases, I am convinced, not only that they are the best contribution for their purpose made in the field of child study during the last 25 years, but also that they are not nearly so accurate as some workers would have us believe. They are by no means infallible, popular magazine and newspaper exploiters to the contrary. For the adequate and reliable differentiation of the difficult or border cases—and there are many of these—the Binet scale must be supplemented by various clinical observations and various other psychological tests of those traits which are basic to intelligence. There is genuine danger in permitting the impression to get abroad unchallenged that we now have a perfect scale of intelligence, which will enable anyone, skilled or unskilled, to dissect the mental and moral mechanisms of any deviating child, and that no further investigating work is necessary. On the contrary, there is urgent need for the prosecution of a systematic program of research, in order to secure reliable mental age norms for all the important mental functions for our American children. Moverover, it can not be too strongly emphasized that mental diagnosis is even more difficult than physical diagnosis, and that no one, whether father, grade teacher, introspective psychologist, or physician, is qualified for this service unless he or she is thoroughly grounded in the modern methods of mental testing and clinical psychology. It is absurd to think that anyone can learn to identify the mental deviations of children simply by learning how to administer certain mechanical tests of intelligence. Mental deviations affect not only the intellectual but also the motor and emotional life. Properly to diagnose these cases requires not only the administration of tests of intelligence and volition, but the use of clinical methods which can only be acquired through years of first-hand experience and which can not be reduced to a rule of thumb. Amateur testers of mentally deviate children in the schools will probably do more harm than good. The problem is not merely the estimation of the degree of backwardness—the determination of the mental age of the child—but the discovery of the mental lapses, deviations, defects, or

excesses peculiar to each child, and the prescription of the differential, pedagogical, and medical treatment which the given case requires. Because a 17-year-old boy and a 12-year-old boy are 9 years old mentally is no reason why both should be subjected to the same educational régime. And that is just what we are doing to-day in the schools for subnormals.

Dr. Seelig, Berlin, Germany: Da Vortragender in seinen wertvollen Ausführungen auf Deutschland hingewiesen hat, sei mir gestattet, einige Errungenschaften der letzten Zeiten daselbst zu erwähnen. Zunächst ist es seit langem fürjeden Mediziner der seine Approbation erlangen will, erforderlich, dass er den erfolgreichen Besuch einer psychiatrischen Klinik nachweisen kann. Besonders aber werden die beamteten Aerzte immer wieder mit den neuesten Erfahrungen der psychiatrischen Wissenschaft bekannt gemacht.

Ausser den Medizinern sind es hauptsächlich die Juristen, für die derartige Kenntnisse von grösster Wichtigkeit sind. Zu diesem Zwecke haben sich an verschiedenen Stellen des Reiches forensisch-psychiatrische Gesellschaften gebildet, in denen Grenzfragen der beiden Disciplinen erörtert werden.

Auch in Deutschland ist die Frage nach den psychischen Defecten bei der verwahrlosten und criminellen Jugend eine ausserordentlich wichtige und acute. Gerade die Fürsorge für diese und ihr Studium durch Psychiater geben die Möglichkeit einer Vorbeugung von Geisteskrankheiten und Verbrechen.

Was die Aufklärung des grossen Publikums über die Fragen der Geisteskrankheiten betrifft, so gehört auch dazu, dass sensationelle Nachrichten aus diesem Gebiete, die für den Fachmann häufig genug den Stempel der Erfindung oder Uebertreibung tragen, nicht durch Weiterverbreitung einen schädigenden und alarmierenden Einfluss auf die Massen ausüben. In allerletzten Zeit hat sich bei uns deshalb ein Comittee gebildet, das aus Psychiatern und Mitgliedern der Presse besteht, um zu versuchen, wenn derartige sensationelle Gerüchte auf dem Gebiete des Irrenwesens enstehen, diese auf ihre Wahrheit zu prüfen oder auf das richtige Mass zurückzuführen.

Ich habe diese Punkte erörtert, um zu zeigen, dass manche der vom Vortragenden erwähnten Probleme bei allen Culturvölkern bestehen und nicht nur vom nationalen sondern internationalem Interesse sind.

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